If it’s called “CLEAR CREEK”, then why aren’t the answers *CLEAR* ?!!

Rhonda Brown
Galveston District
COE

WHITE DWARF STARS:

The oldest stars in the universe……

12-13 billion years old.

Clear Creek – Brief Chronology

1962 – Initial Study Authorized by Flood Control Act of 1962

1968 – Project Authorized by Flood Control Act of 1968

1970 – National Environmental Policy Act (NEPA)

1972-86 – No new construction starts

1997 Jul – Second Outlet Channel completed

1997 Dec –Local Sponsor presented “Sponsor-Proposed Alternative” due to public opposition to Corps project

1999 Feb – COE determines GRR required due to chang

CLEAR CREEK PROJECT STUDY TEAM AND SPONSORS

U.S. Army Corps of Engineers

P.O. Box 1229
Galveston, Texas 77553-1229
409.766.3051

LOCAL SPONSORS

Harris County Flood Control District

(Lead Sponsor)

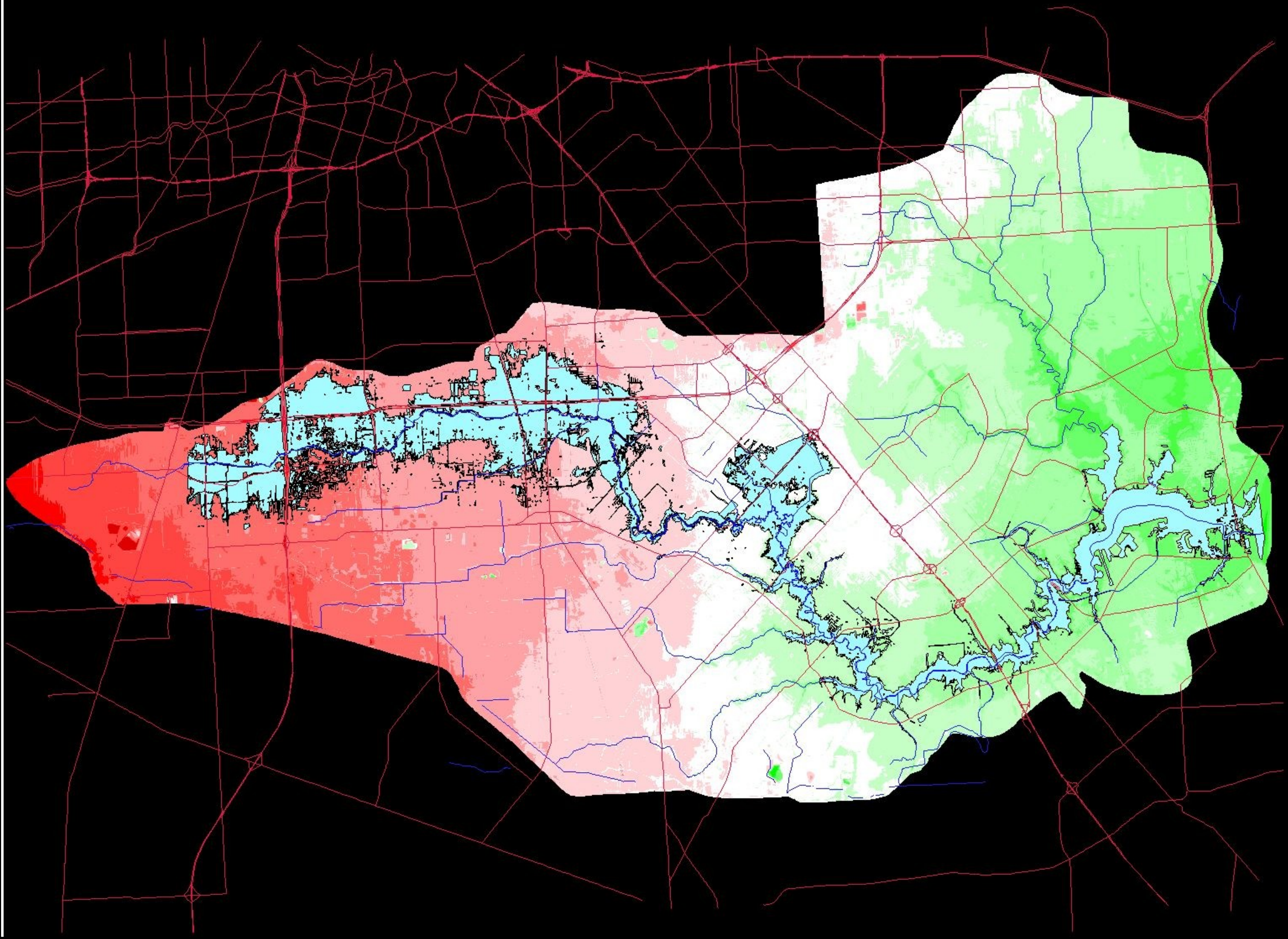
9900 Northwest Freeway
Houston, Texas 77092
713.684.4040

Galveston County

123 Rosenberg
Galveston, Texas 77550

Brazoria Drainage District Number Four

4805 West Broadway
Pearland, Texas 77581

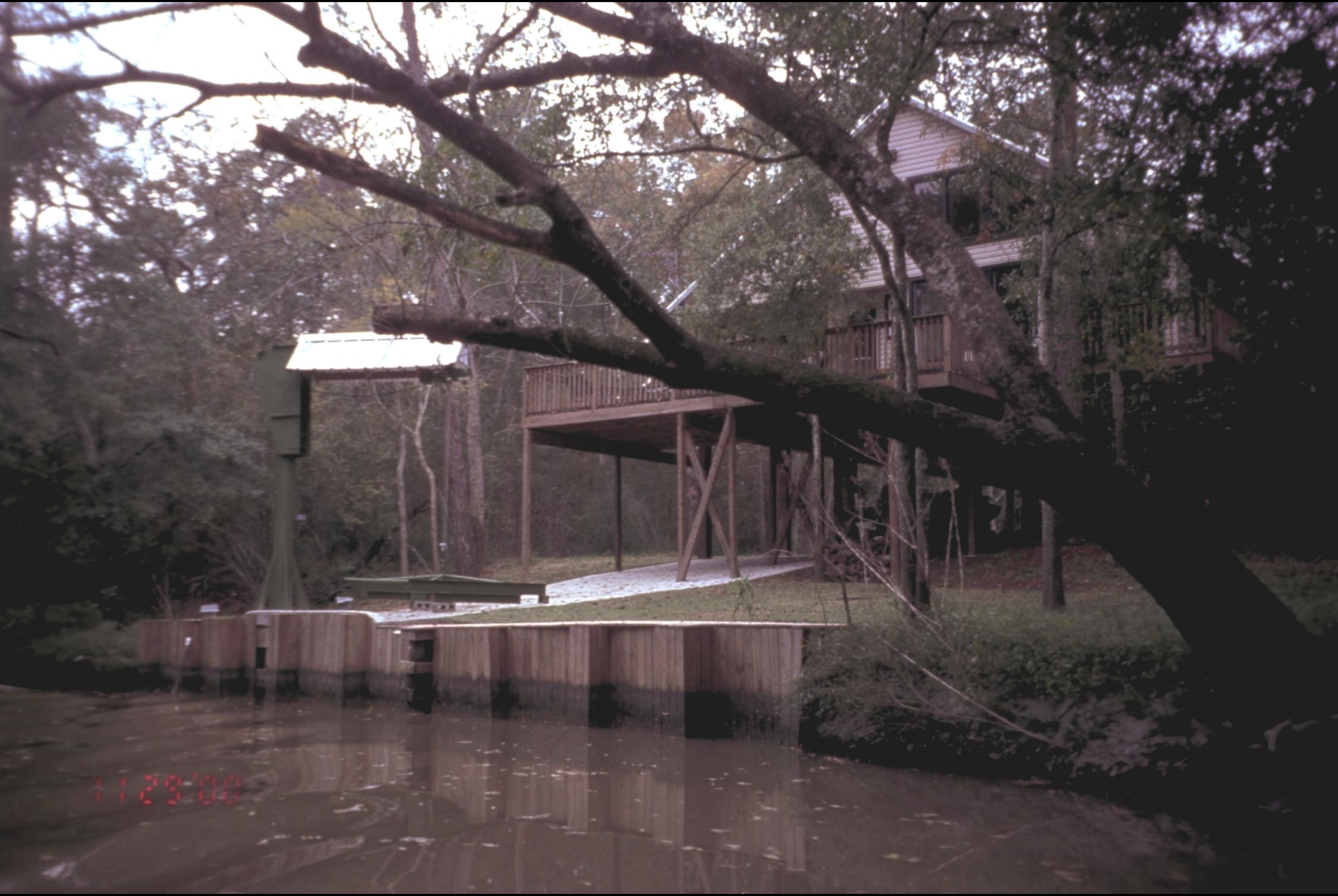


Boa

11 29 '00

Harris County Flood Control District

Harris County
Flood Control District



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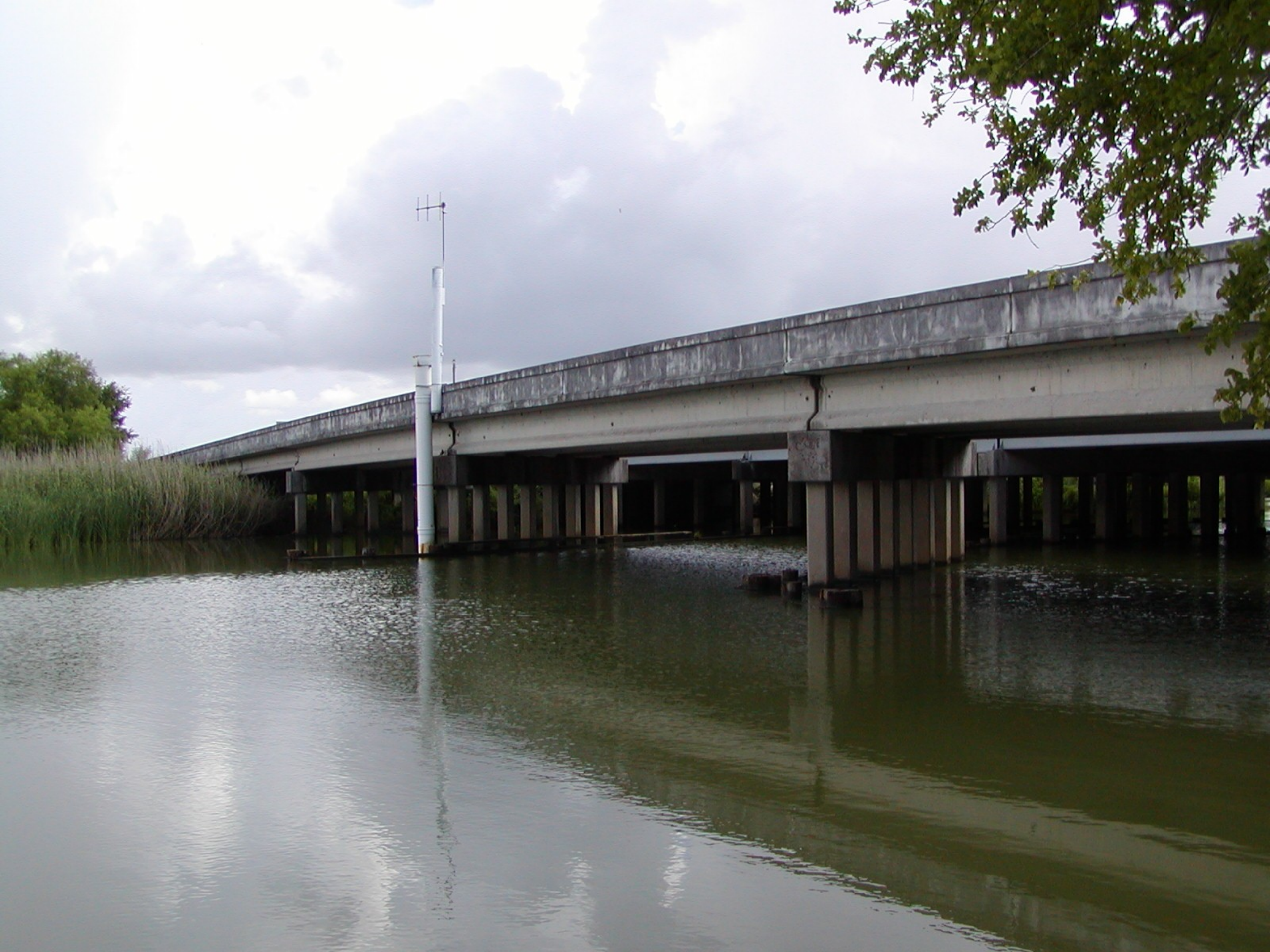
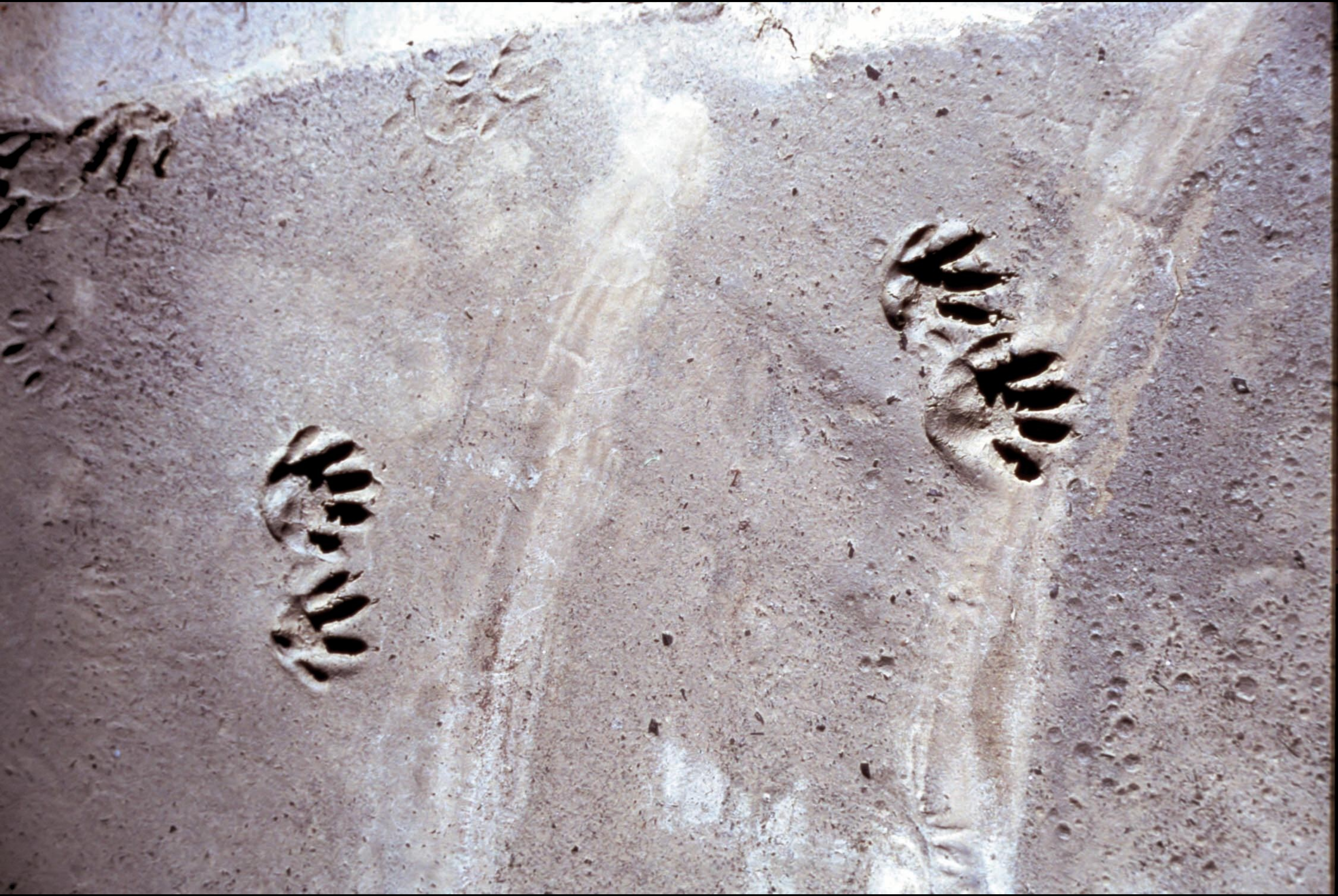
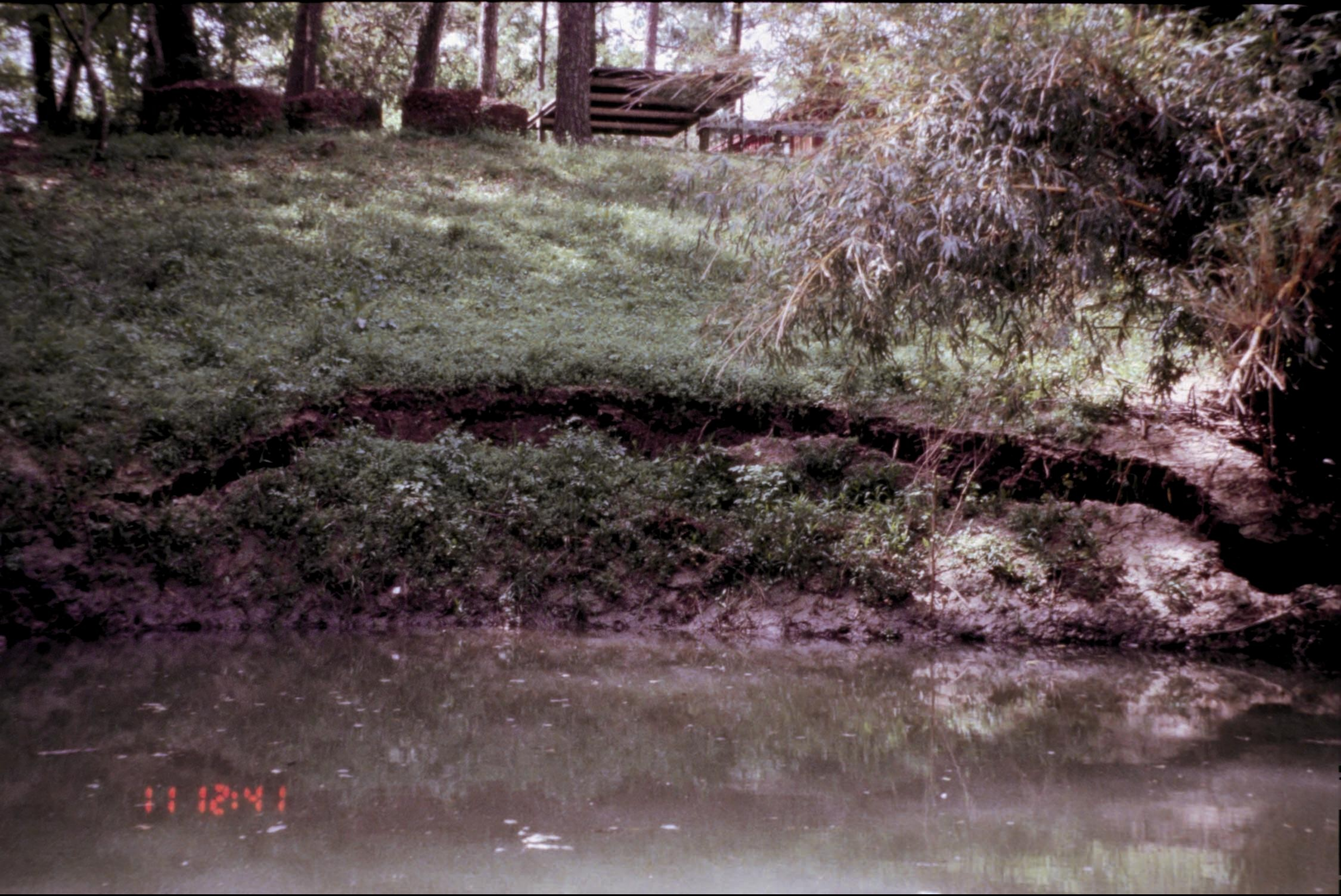
Texas O.C.C.
11 29 '00



11 29 00

Harris County
Flood Control District

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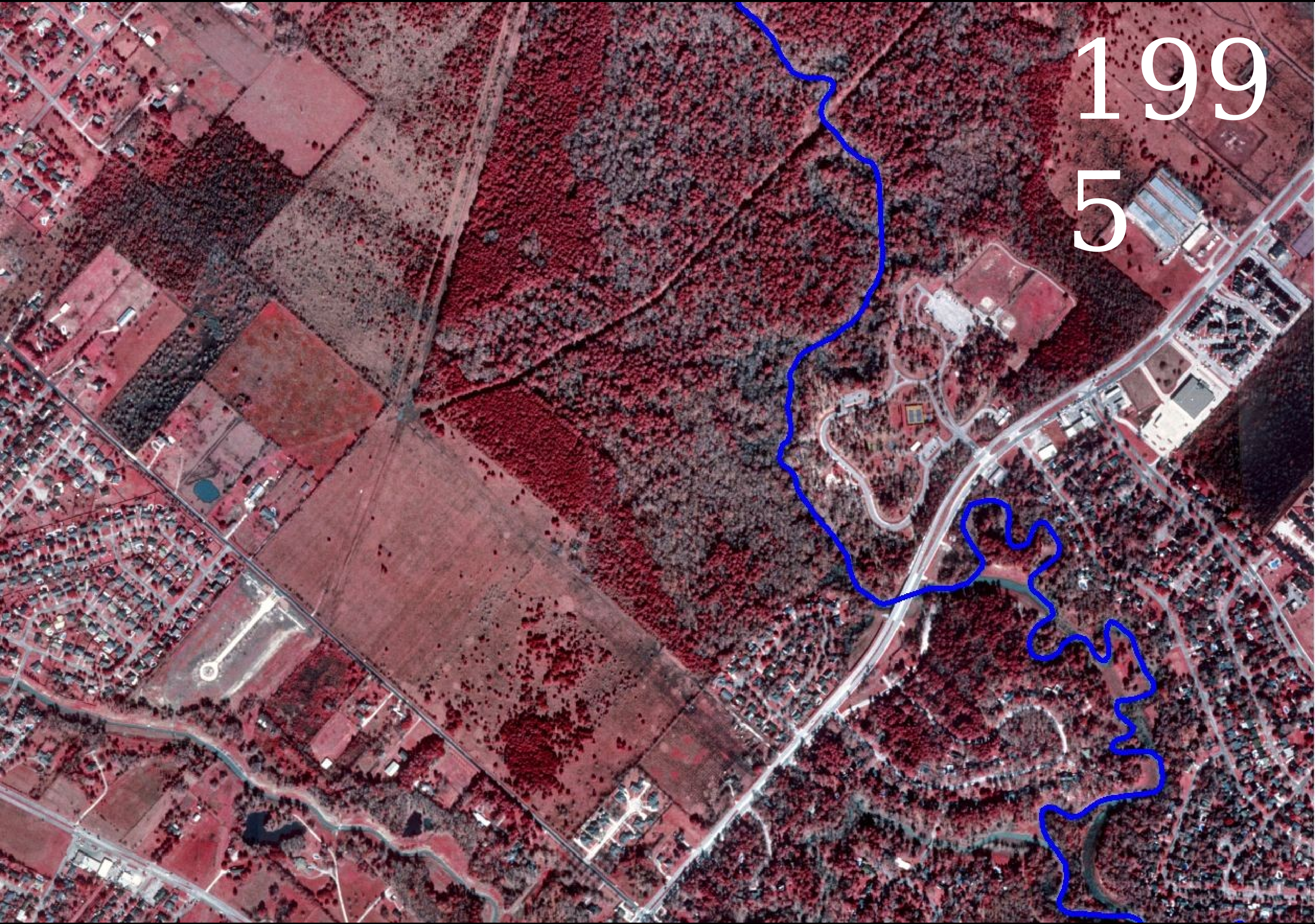
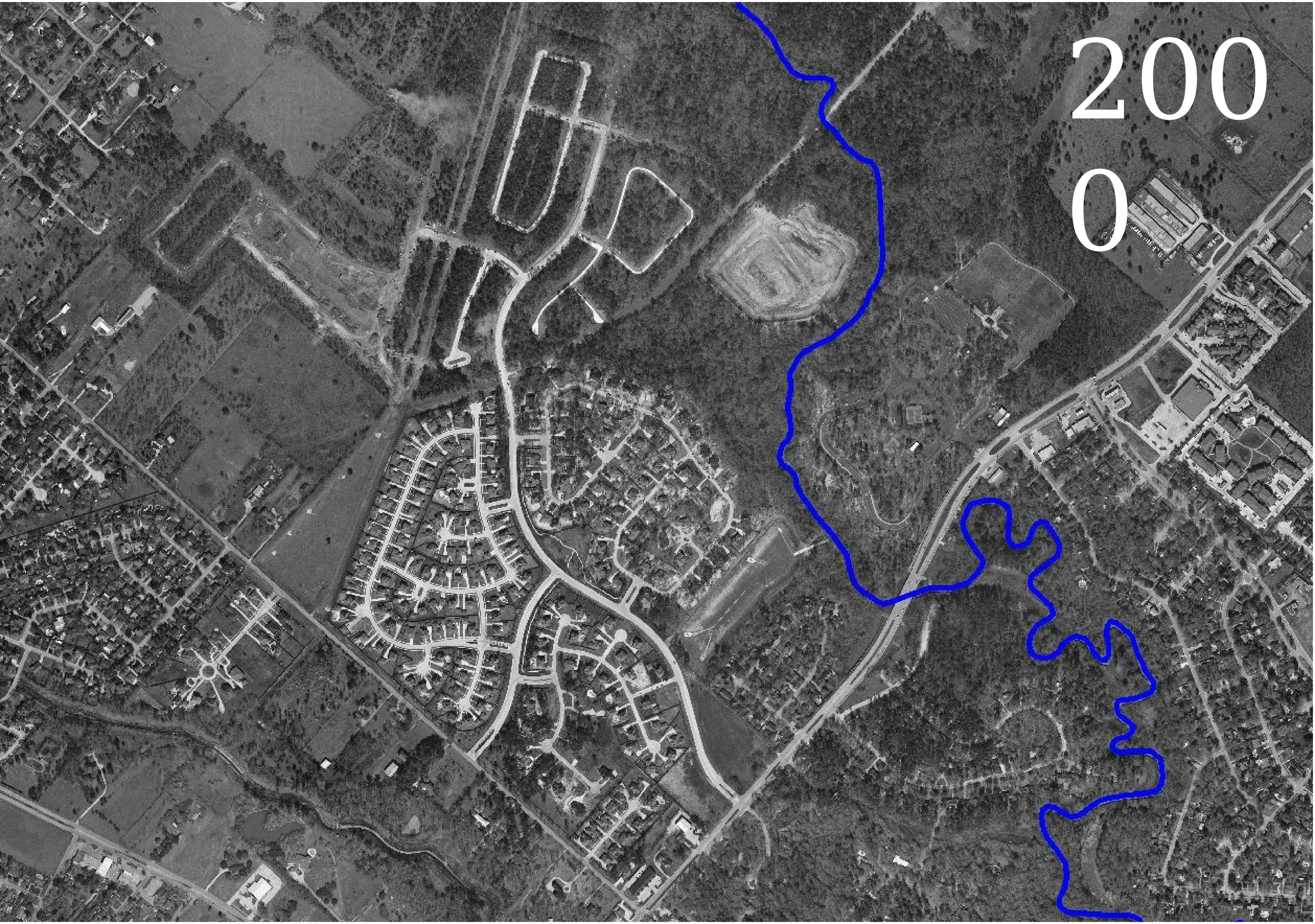
11 13 28

9 18 '01



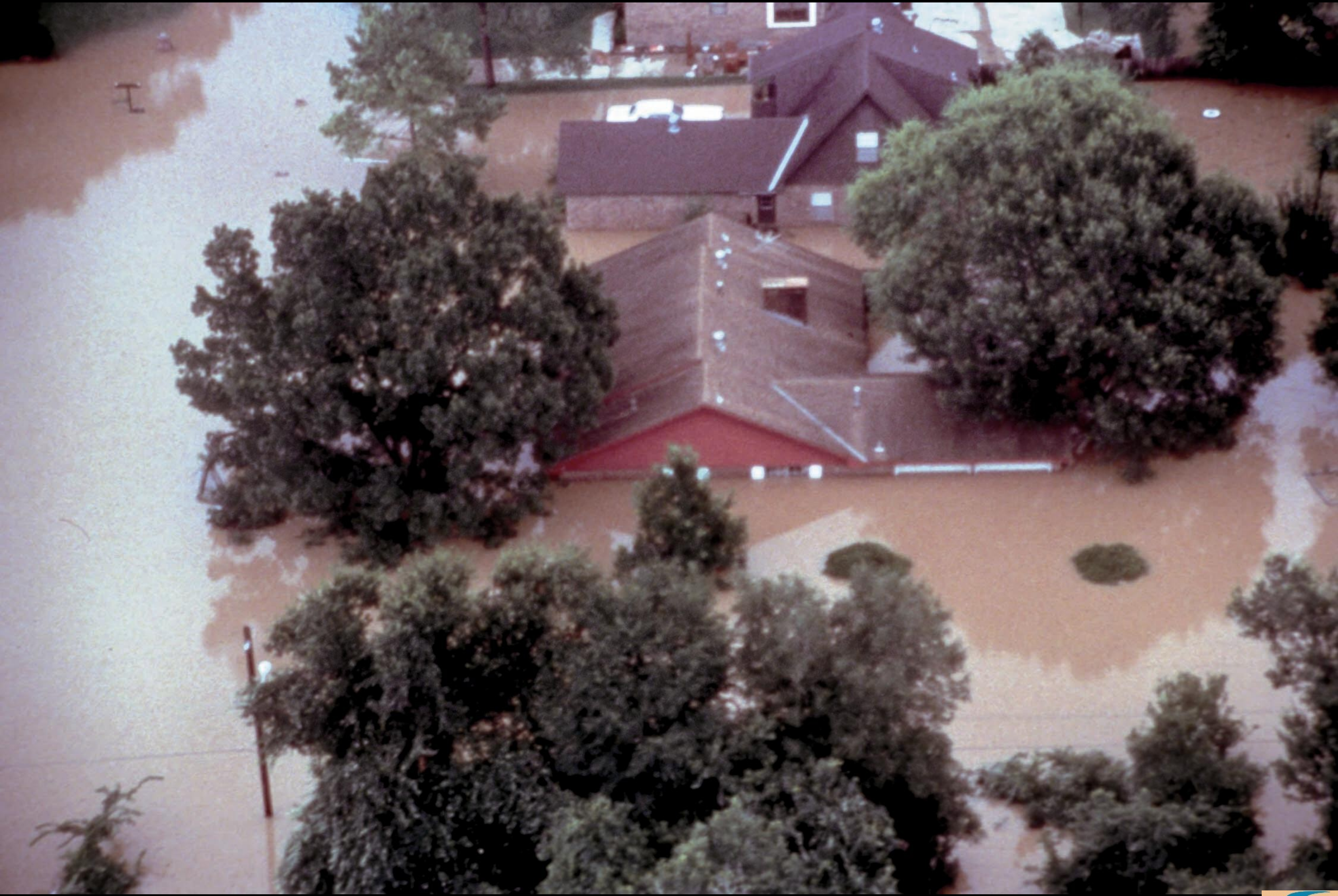
1995


2000

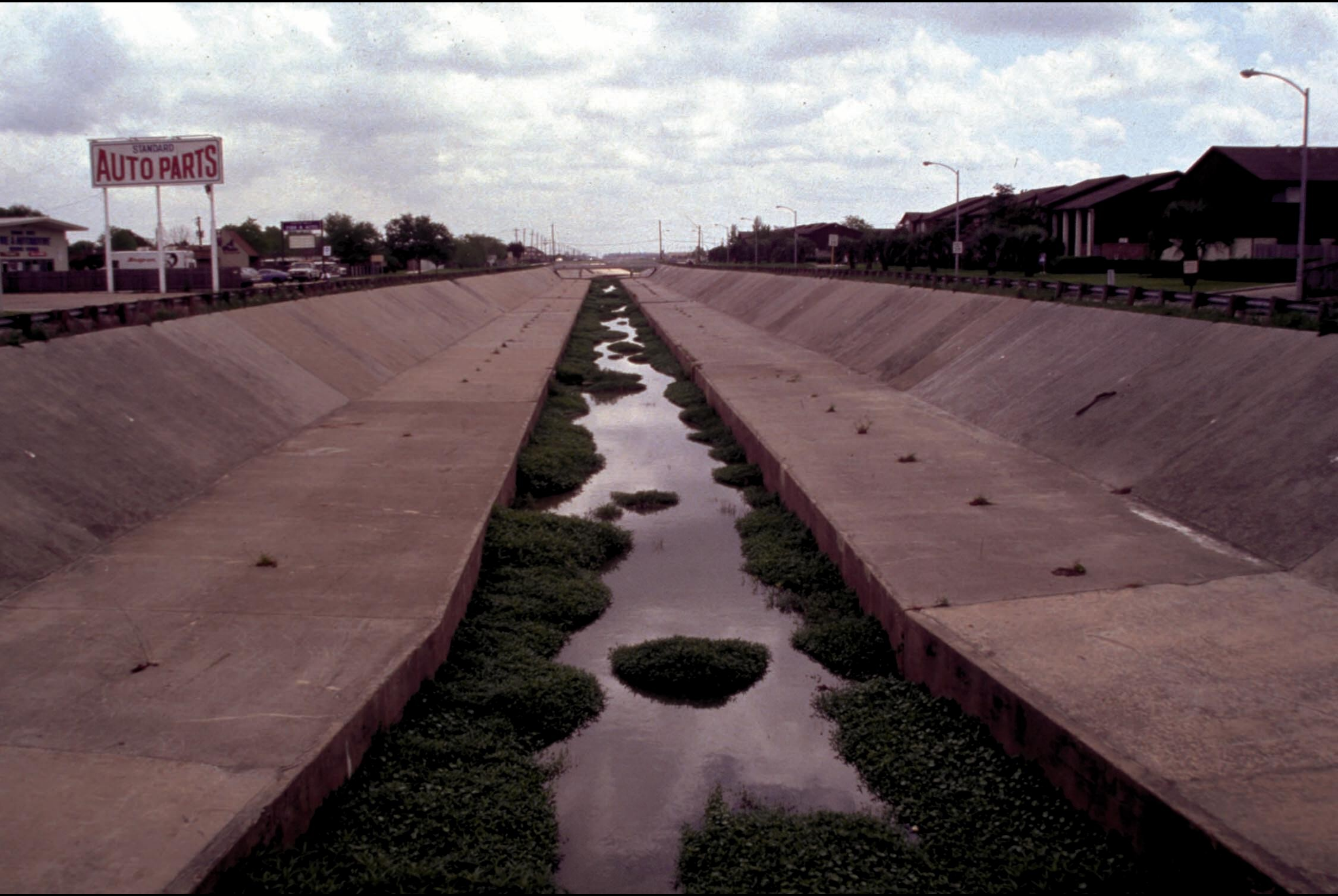
Harris County
Flood Control District

9 18 '01

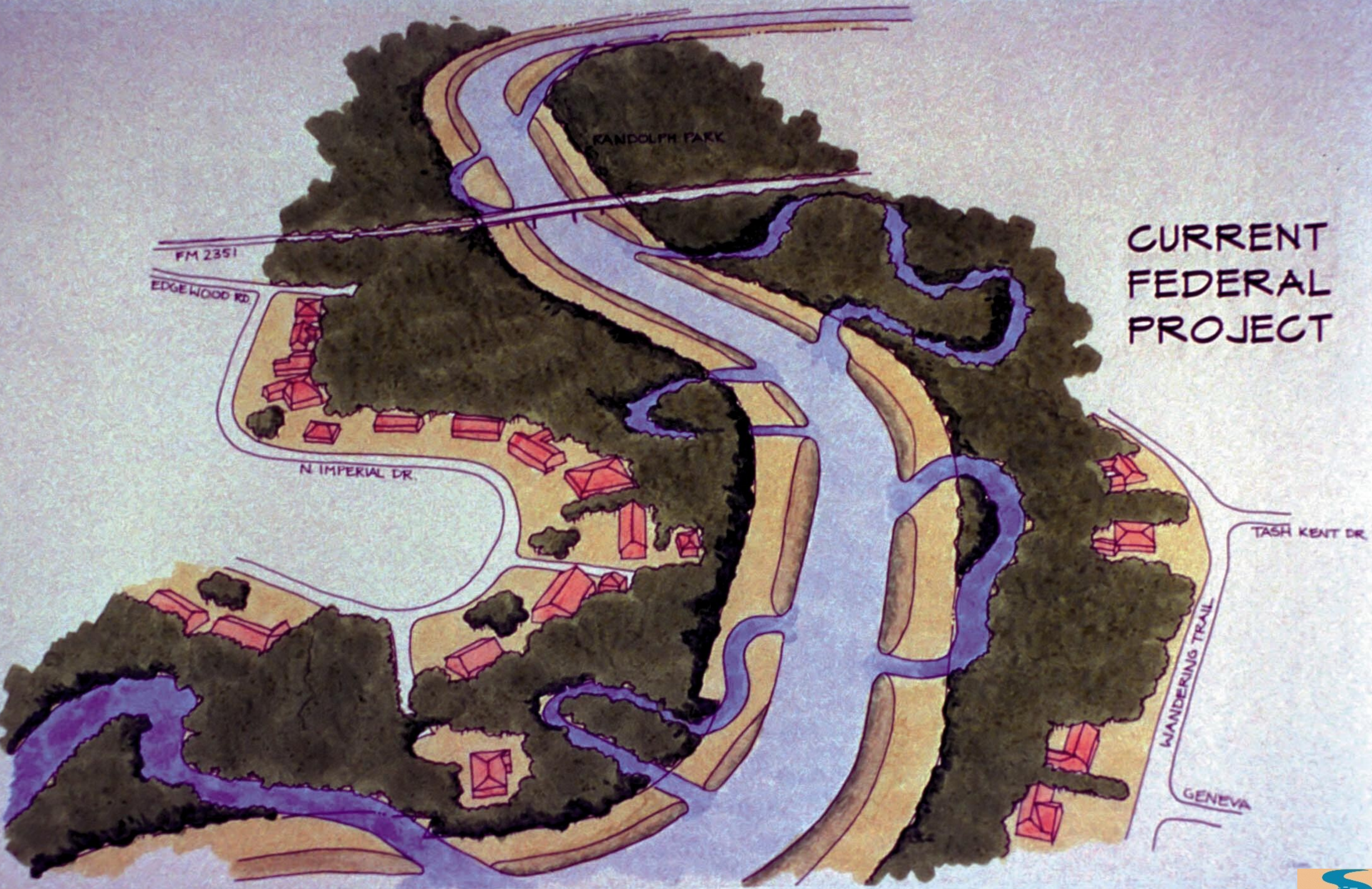
Harris County
Flood Control District



Harris County
Flood Control District

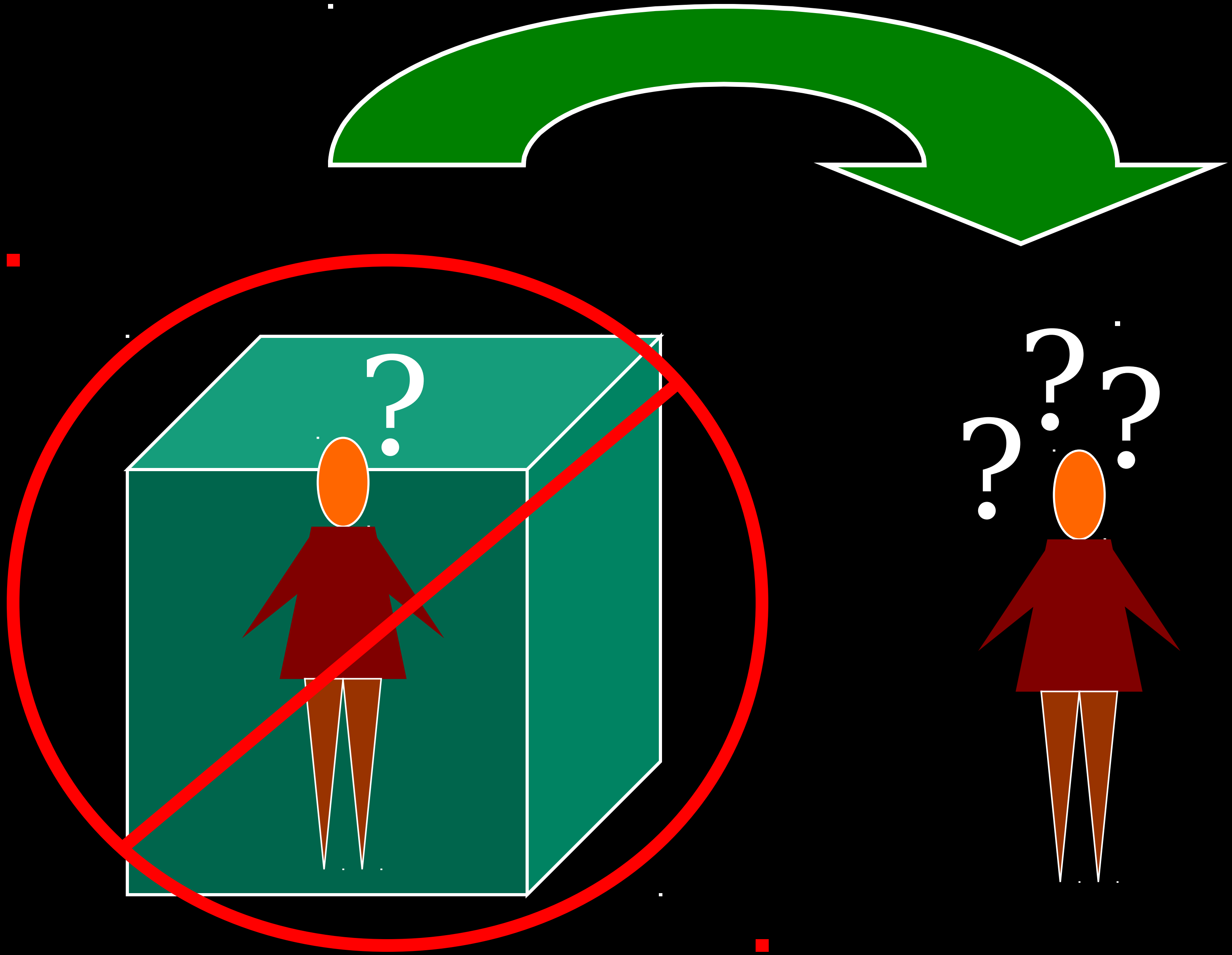

STANDARD
AUTO PARTS

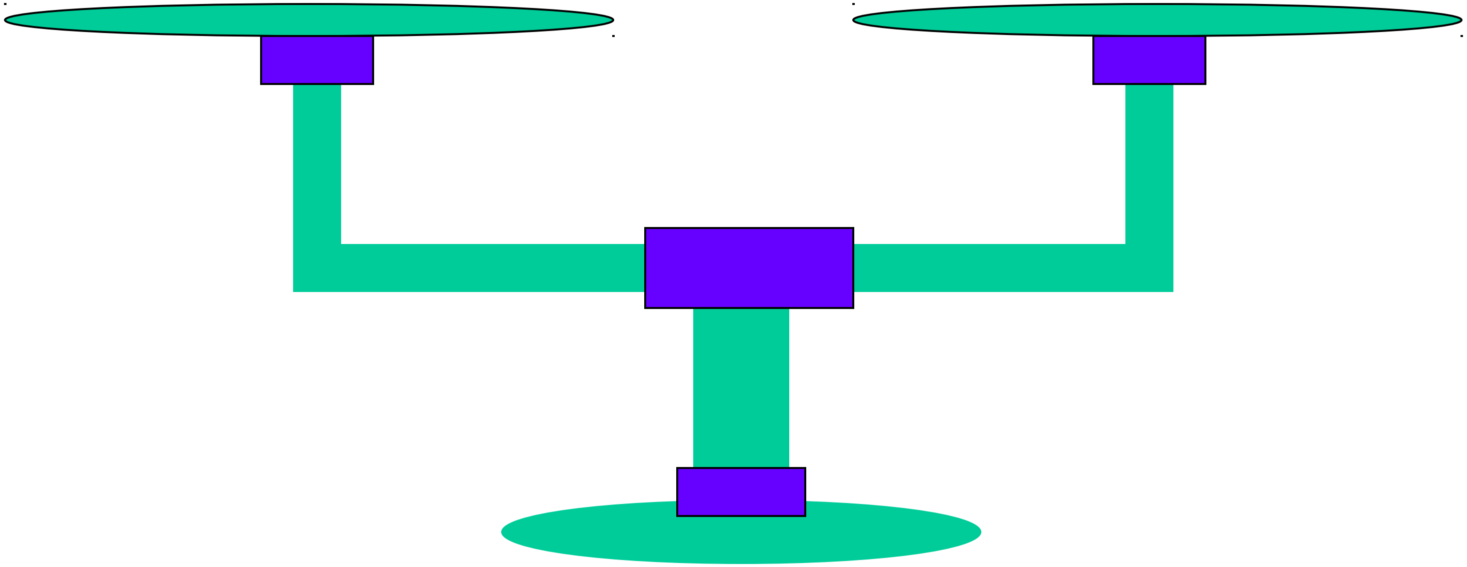
CURRENT FEDERAL PROJECT


RANDOLPH PARK
FM 2351
EDGEWOOD RD.
N. IMPERIAL DR.
TASH KENT DR
WANDERING TRAIL
GENEVA

Harris County
Flood Control District

Clear Creek GRR - *where do we go from here?….*





Flood Reduction = Ecosystem Restoration

What is "Ecosystem Restoration"?

"The return of an ecosystem to a close approximation of its condition prior to disturbance." US Natural Resource Council, 1992

"To repair or replace essential ecosystem structures and functions that have been altered or eliminated by disturbance." GD Cooke & WR Jordan, 1995

"The process of renewing and maintaining ecosystem health." Society for Ecological Restoration, 1995

"The process of repairing damage caused by humans to the diversity and dynamics of indigenous ecosystems." Texas Society for Ecological Restoration, 2001

"To restore significant ecosystem function, structure, and dynamic processes that have been degraded." USACE ER 1165-2-501, 1999

Restoration Targets

Specific Restoration Function

Assisted Restoration

Functionally-focused Restoration

Ecological Restoration

Historic Restoration

Sustainable Development

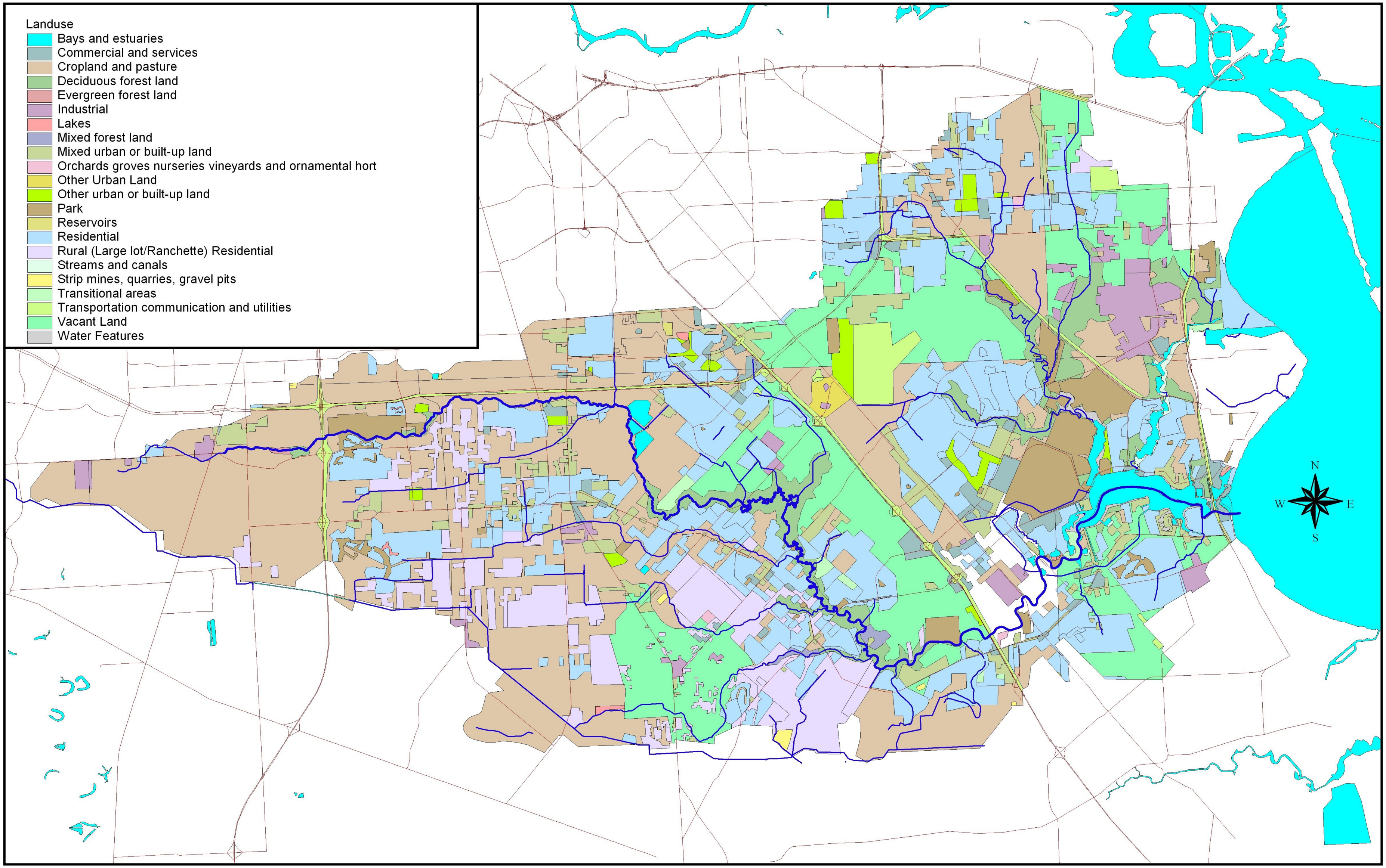
“Economic growth and activities that do not deplete or degrade the environmental resources upon which present and future economic growth depend.”

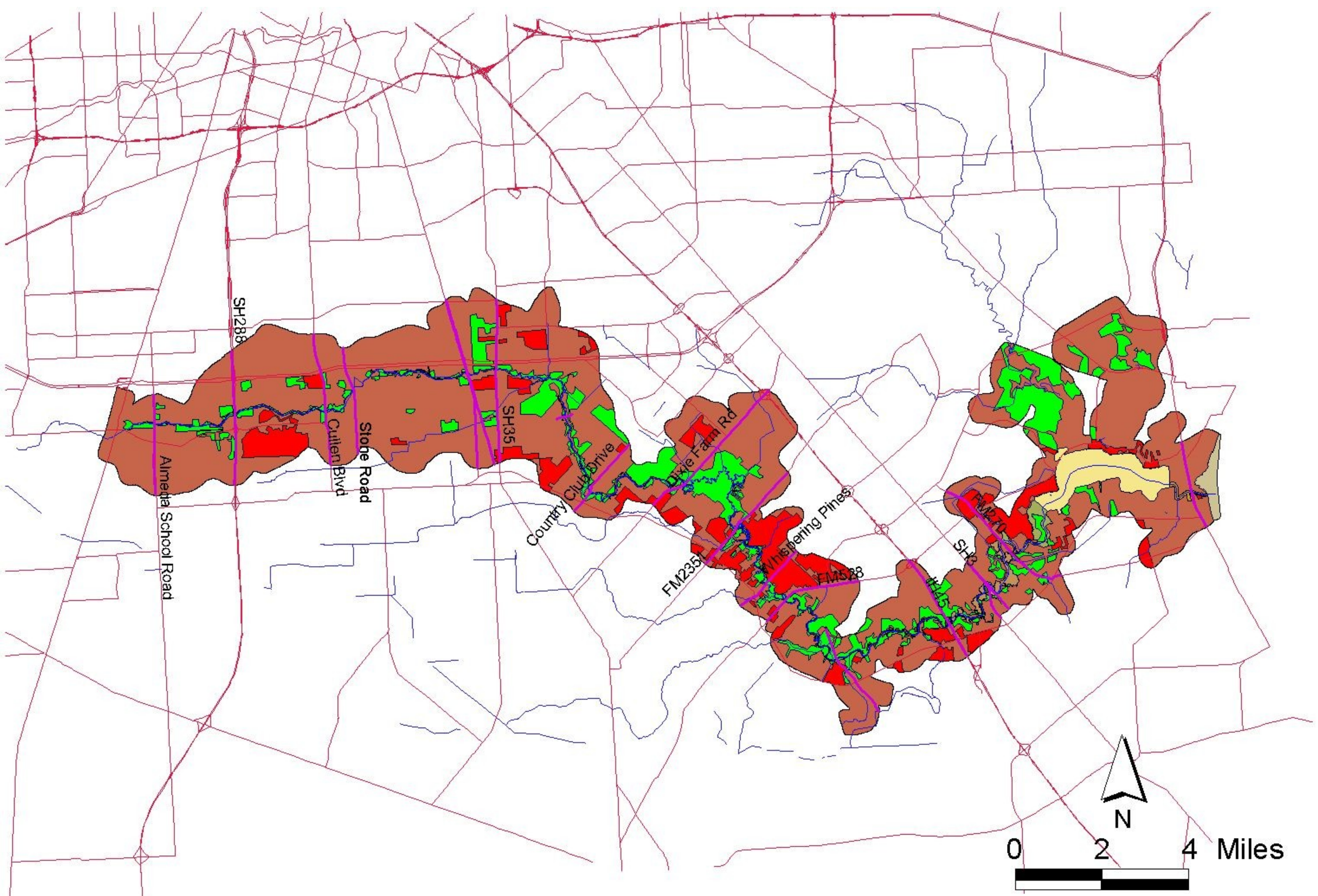
Dictionary of Ecology and Environmental Science

The Journey Toward Sustainable Development

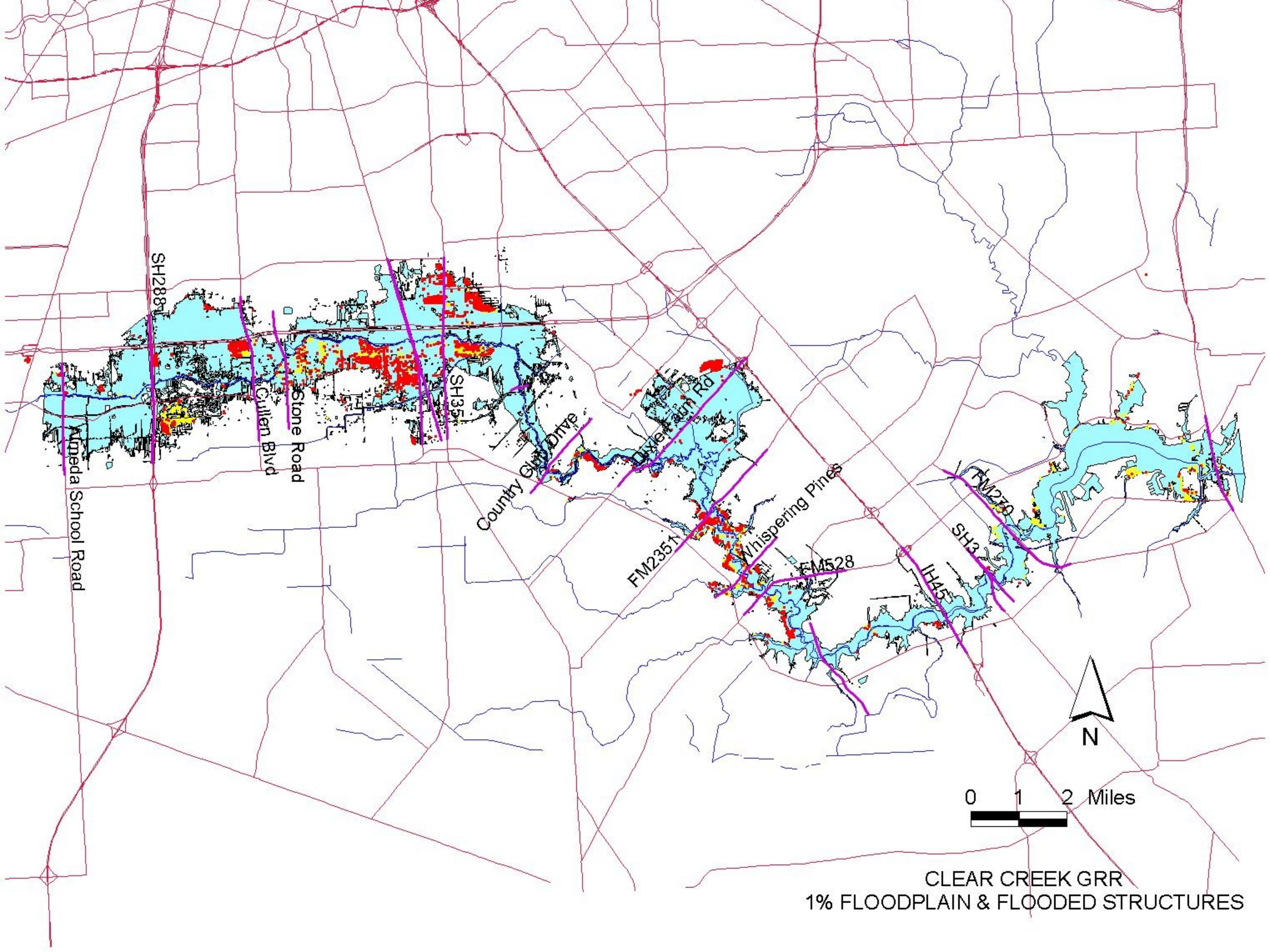
"We're on a common journey shared by many people and organizations in our country, and around the world. It is a journey in which we are transitioning toward Sustainable Development."

LTG Flowers

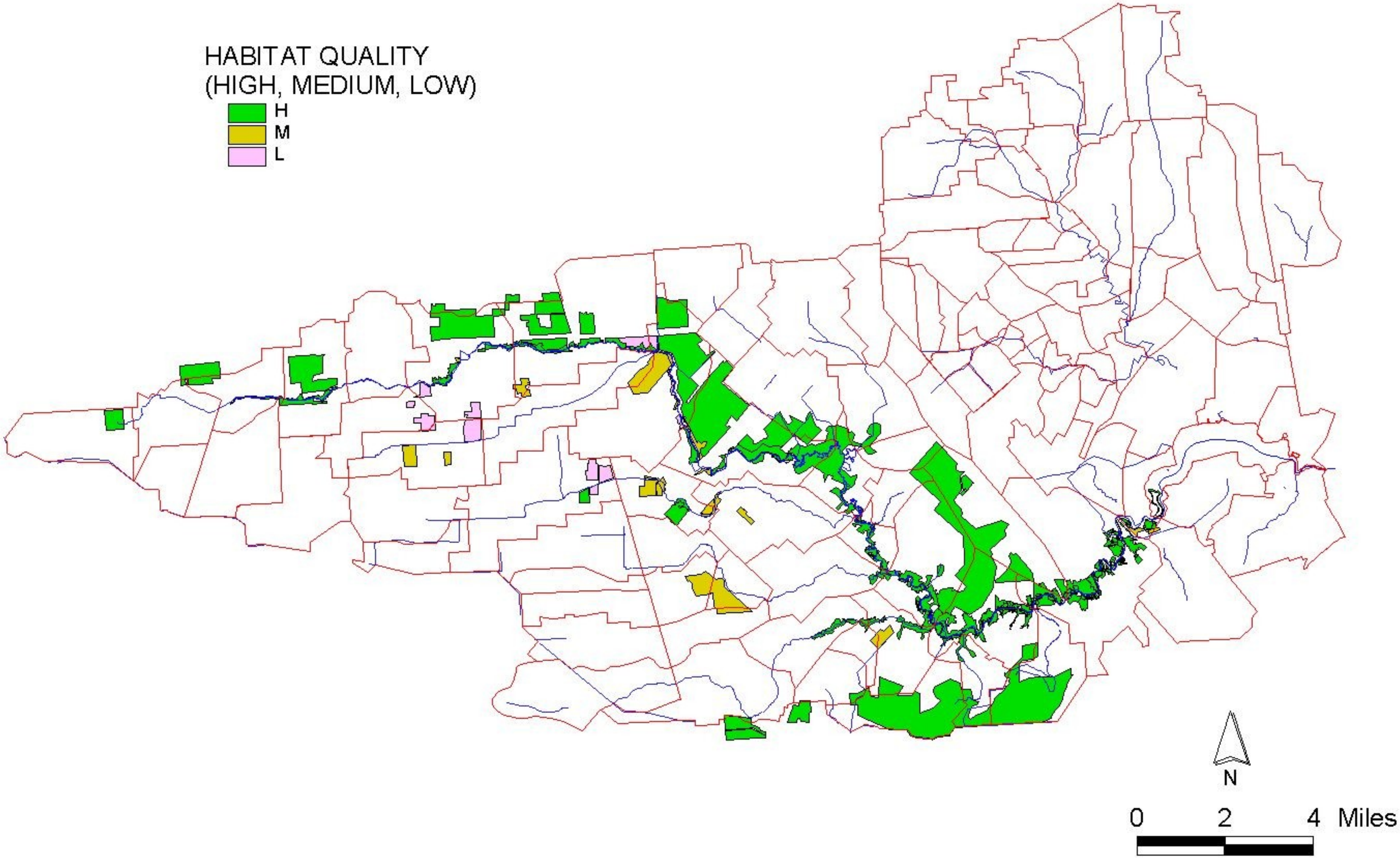

Landuse
Bays and estuaries
Commercial and services
Cropland and pasture
Deciduous forest land
Evergreen forest land
Industrial
Lakes
Mixed forest land
Mixed urban or built-up land
Orchards groves nurseries vineyards and ornamental hort
Other Urban Land
Other urban or built-up land
Park
Reservoirs
Residential
Rural (Large lot/Ranchette) Residential
Streams and canals
Strip mines, quarries, gravel pits
Transitional areas
Transportation communication and utilities
Vacant Land
Water Features
N
W
E
S


SH288
Almeda School Road
Cullen Blvd
Stone Road
SH35
Country Club Drive
Dixie Farm Rd
FM2351
Whispering Pines
FM528
SH3
IH45
FM270
N
0
2
4 Miles

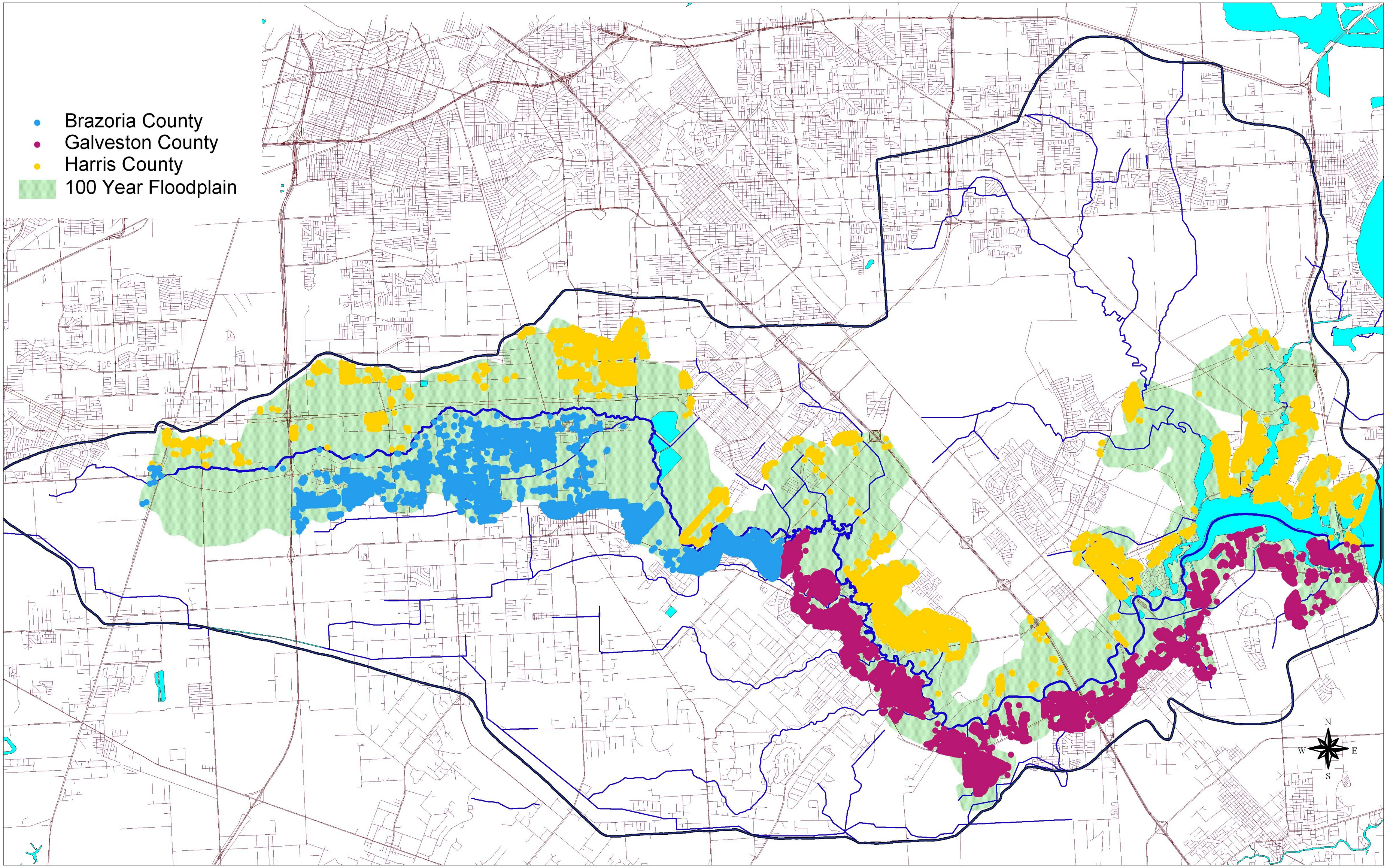
CLEAR CREEK GRR
HYDRAULIC ROUGHNESS
POLYGON MAP

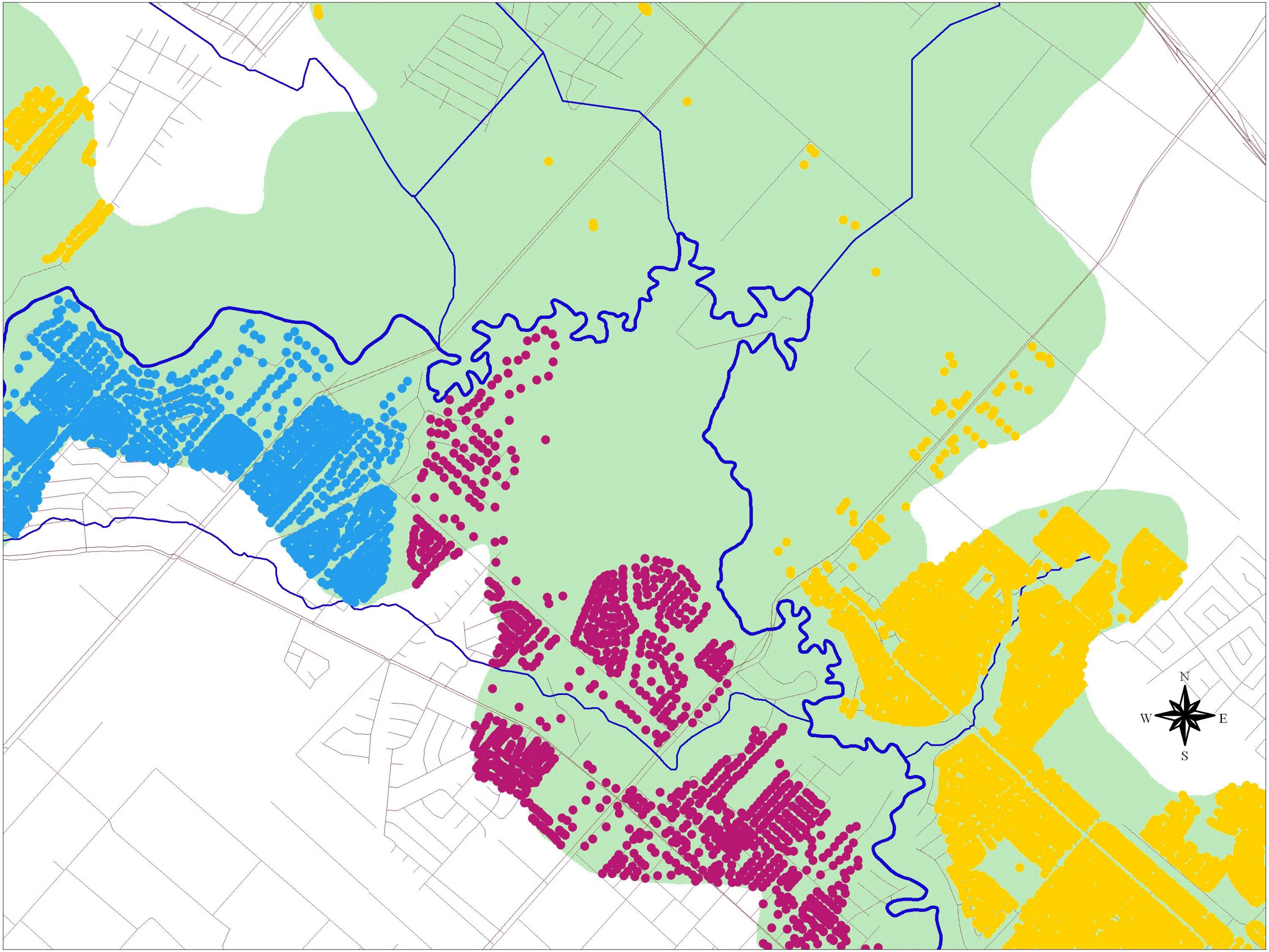

Almeda School Road
SH288
Cullen Blvd
Stone Road
SH35
Country Club Drive
Dixie Farm Rd
FM2351
Whispering Pines
FM528
IH45
SH3
FM270
N
0 1 2 Miles

CLEAR CREEK GRR
1% FLOODPLAIN & FLOODED STRUCTURES


HABITAT QUALITY
(HIGH, MEDIUM, LOW)
🟩 H
🟨 M
🟪 L
N
0
2
4 Miles

CLEAR CREEK GRR
WATERSHED HABITAT QUALITY


● Brazoria County
● Galveston County
● Harris County
🟩 100 Year Floodplain
N
W
E
S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W
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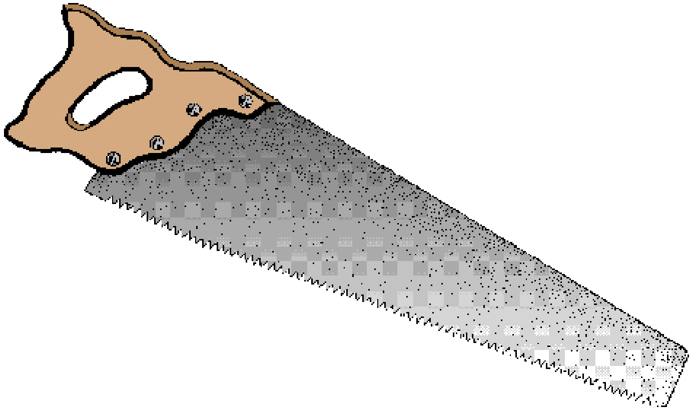
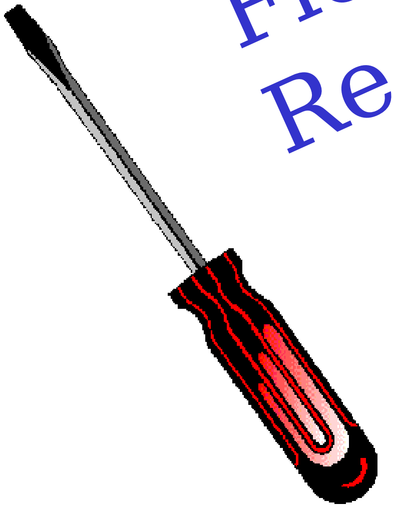
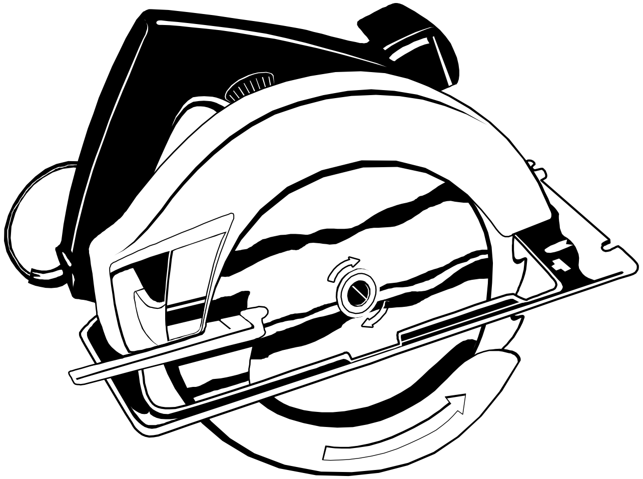


Ecosystem Restoration

Flood Damage Reduction



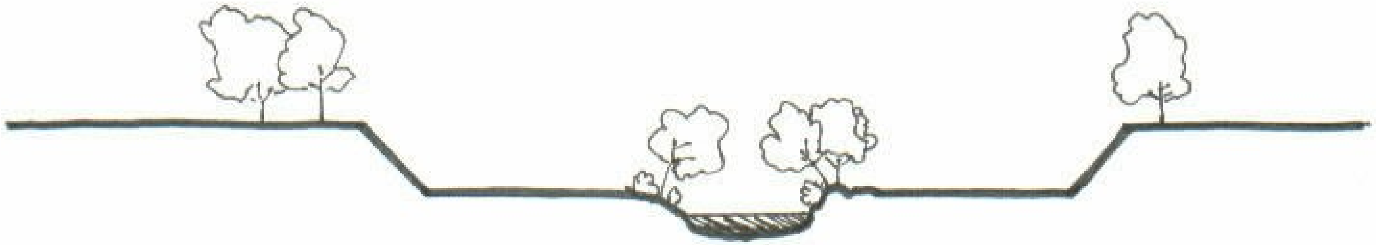
TOOLS
?



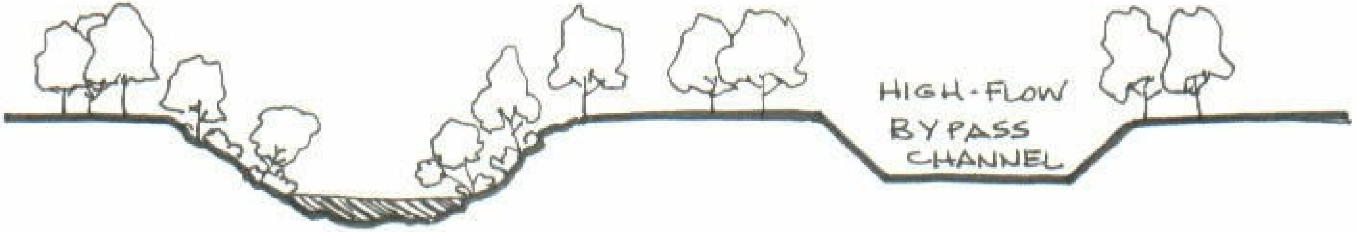
Flood Damage Reduction Measures/Tools

Notebook Includes:

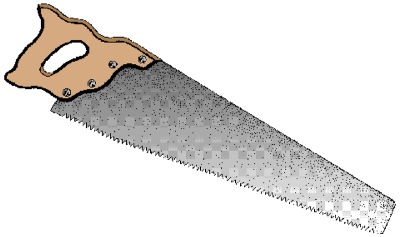
1) Shallow, wide earthen trapezoid (preserving existing channel)



2) High-flow bypass channels (preserving existing channel entirely)

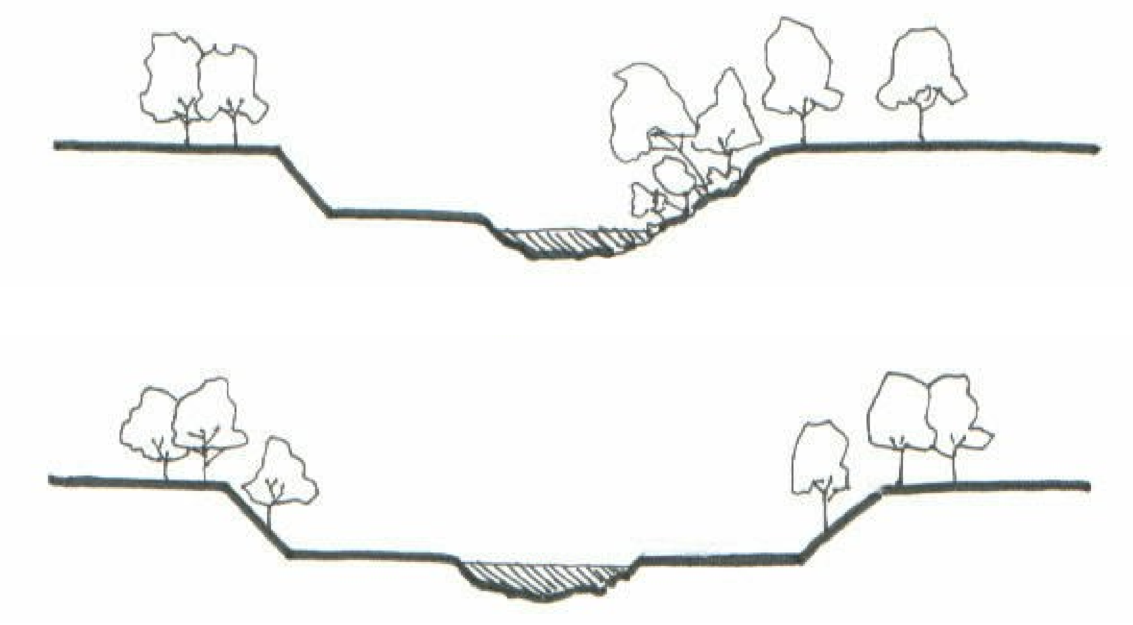

HIGH-FLOW
BY PASS
CHANNEL

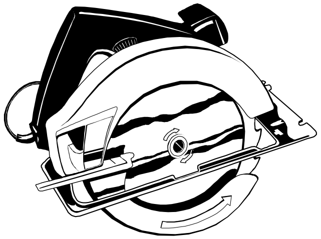
3) Detention basins w/ wet botton
(wetland/marsh creation)



4) Bridge raising and widening

5) Excavated, earthen trapezoidal channel w/ park-like greenway features (1-side only and/or both sides)

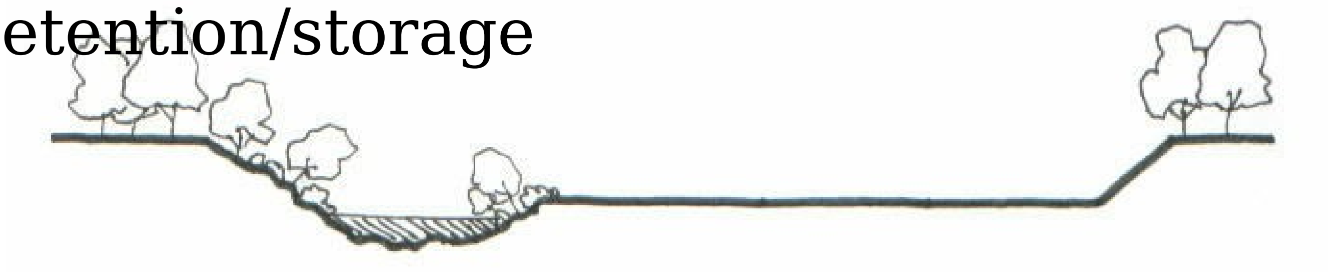




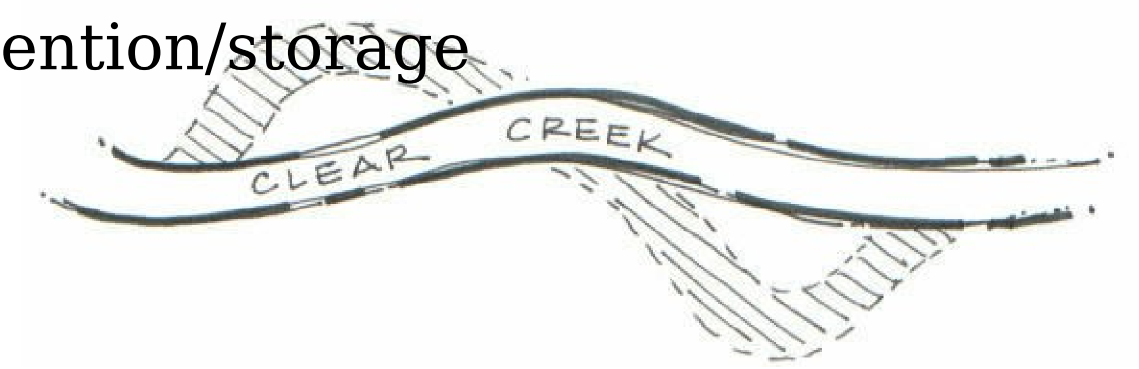
6) Watershed Management Practices

7) Selective clearing of underbrush/small trees (increase conveyance)

8) Inline detention/storage

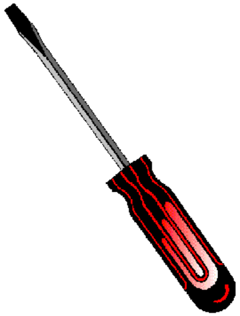


9) Oxbow meander cut-offs as detention/storage



10) Buyouts

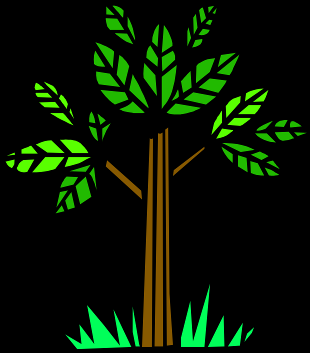
Ecosystem Restoration Measures/Tools



Notebook Includes:

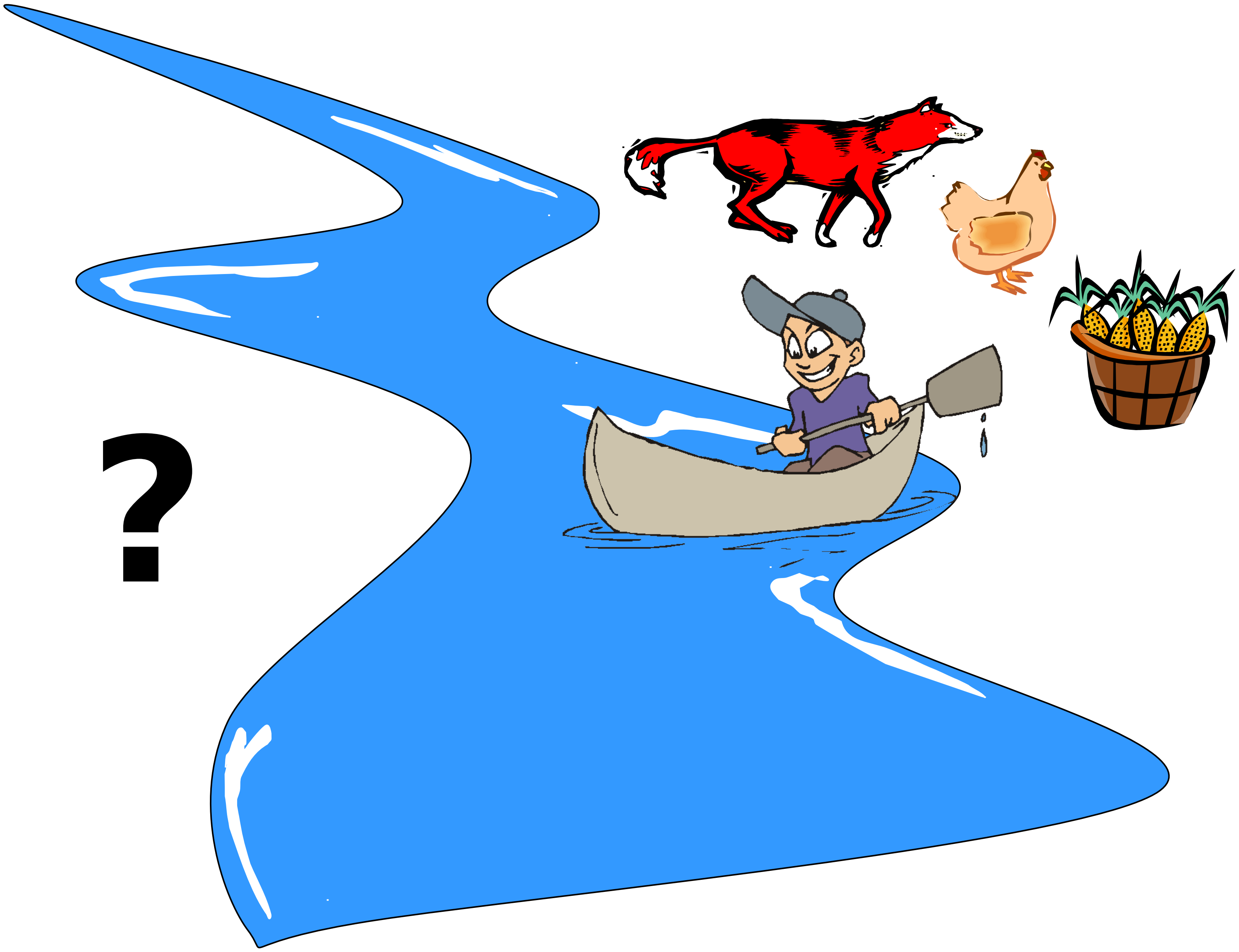
Restoration of….

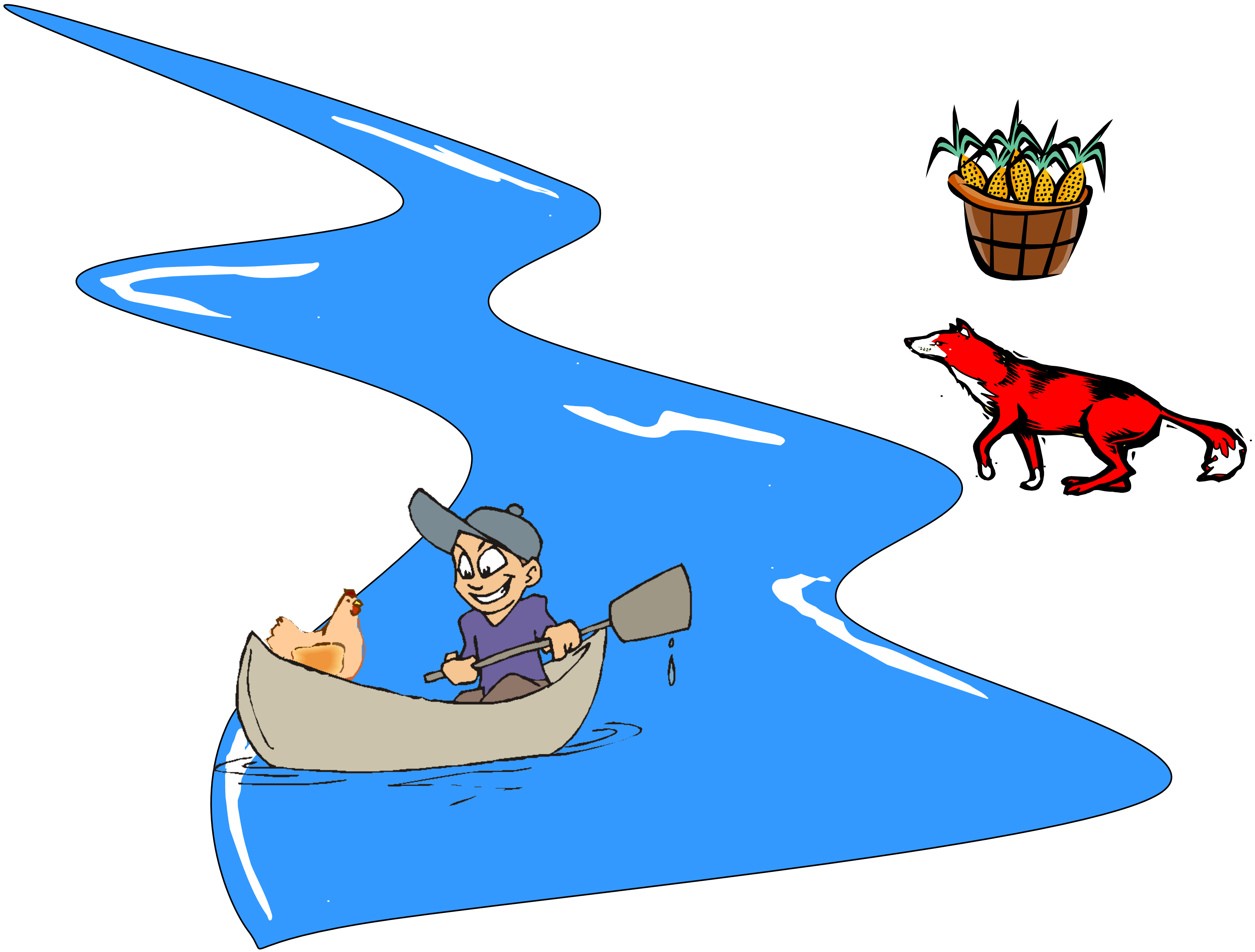
1) Back bay aquatic nursery areas lost to subsidence.
2) Floodplains lost to farming/development.
3) Marshlands lost to sedimentation.
4) Riparian woodlands lost to farming.
5) Prairie pothole freshwater wetlands.
6) Coastal prairie grasslands lost to farming.
7) Tributary hydrology for water quality.

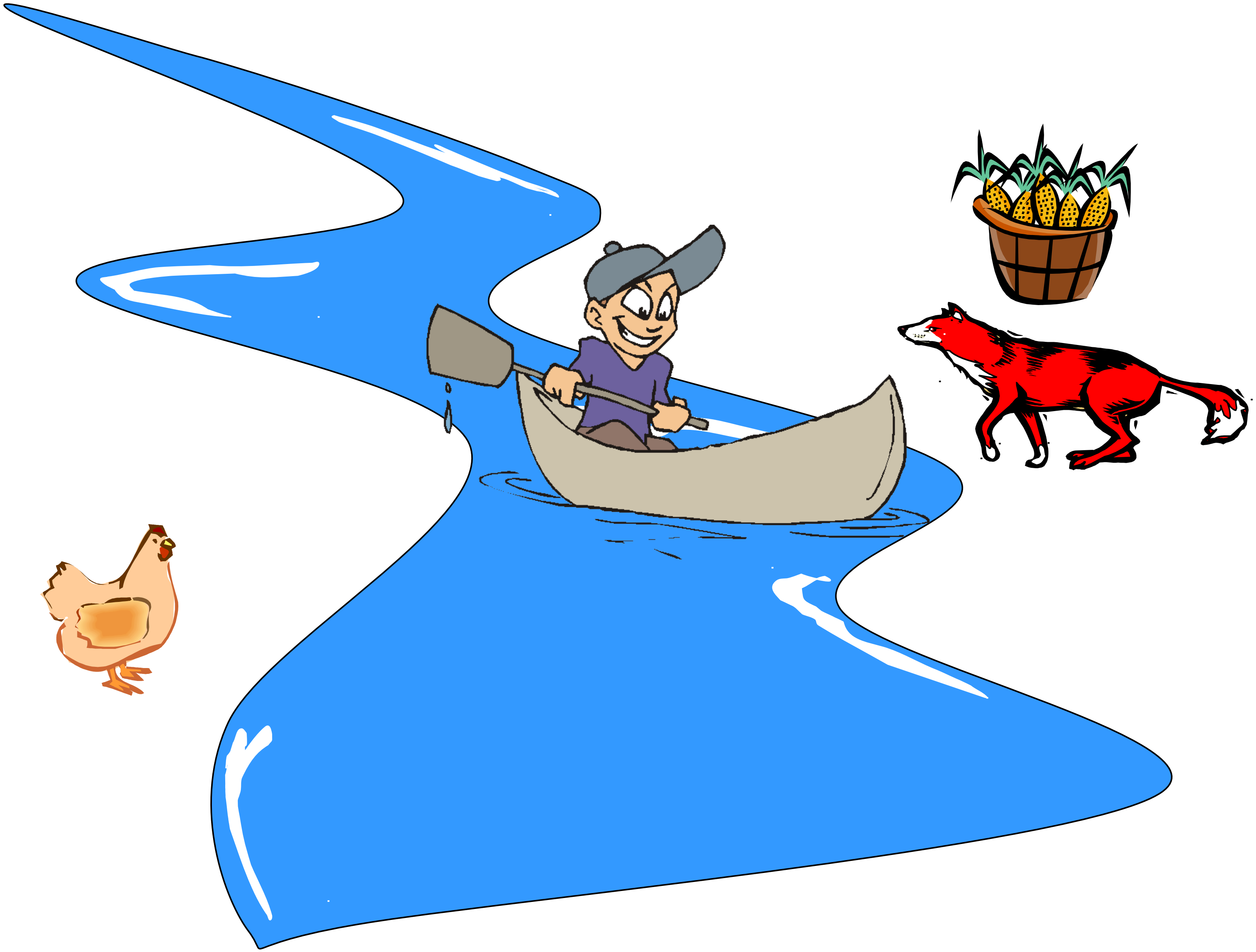


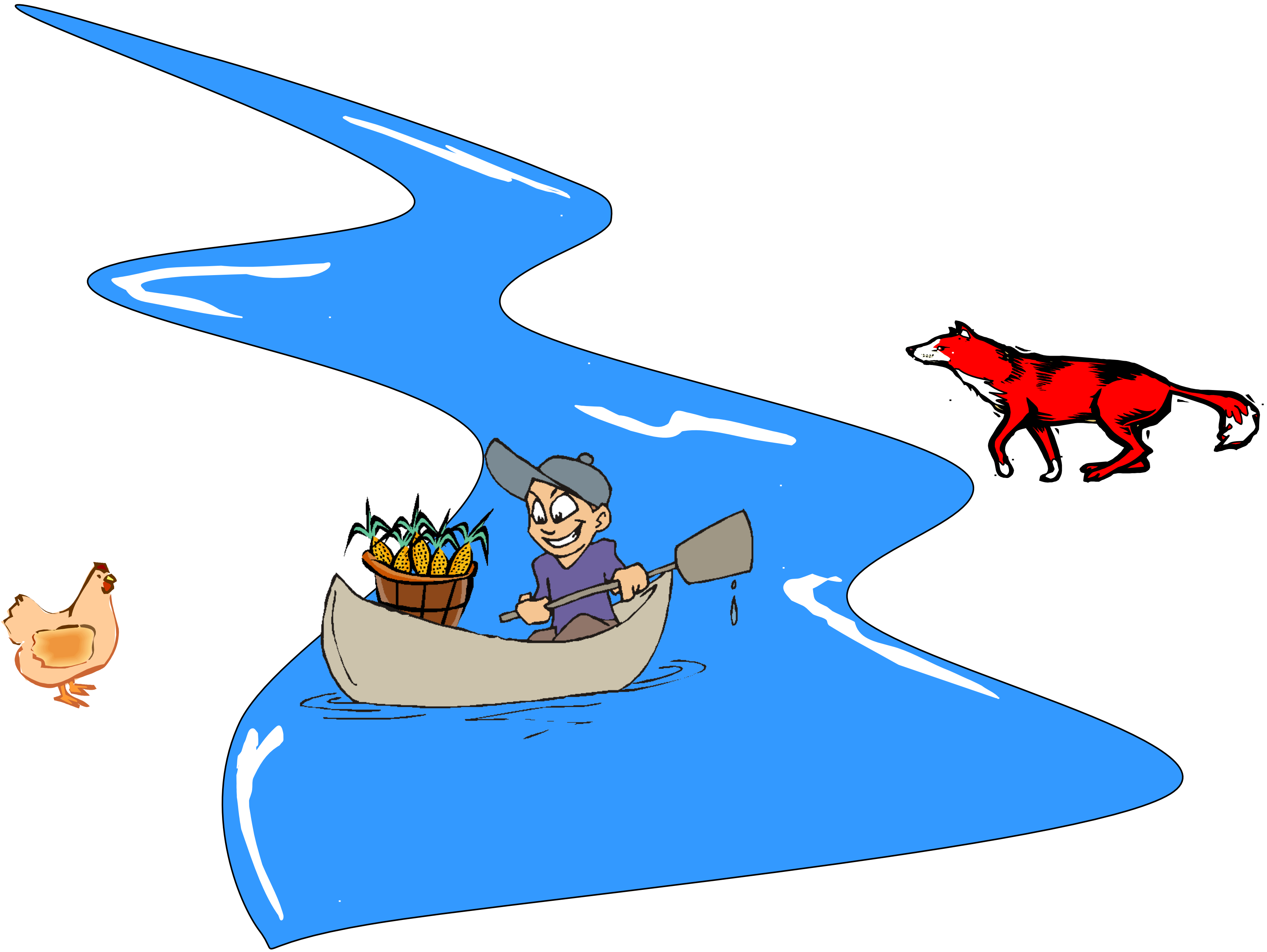
Other tools include:

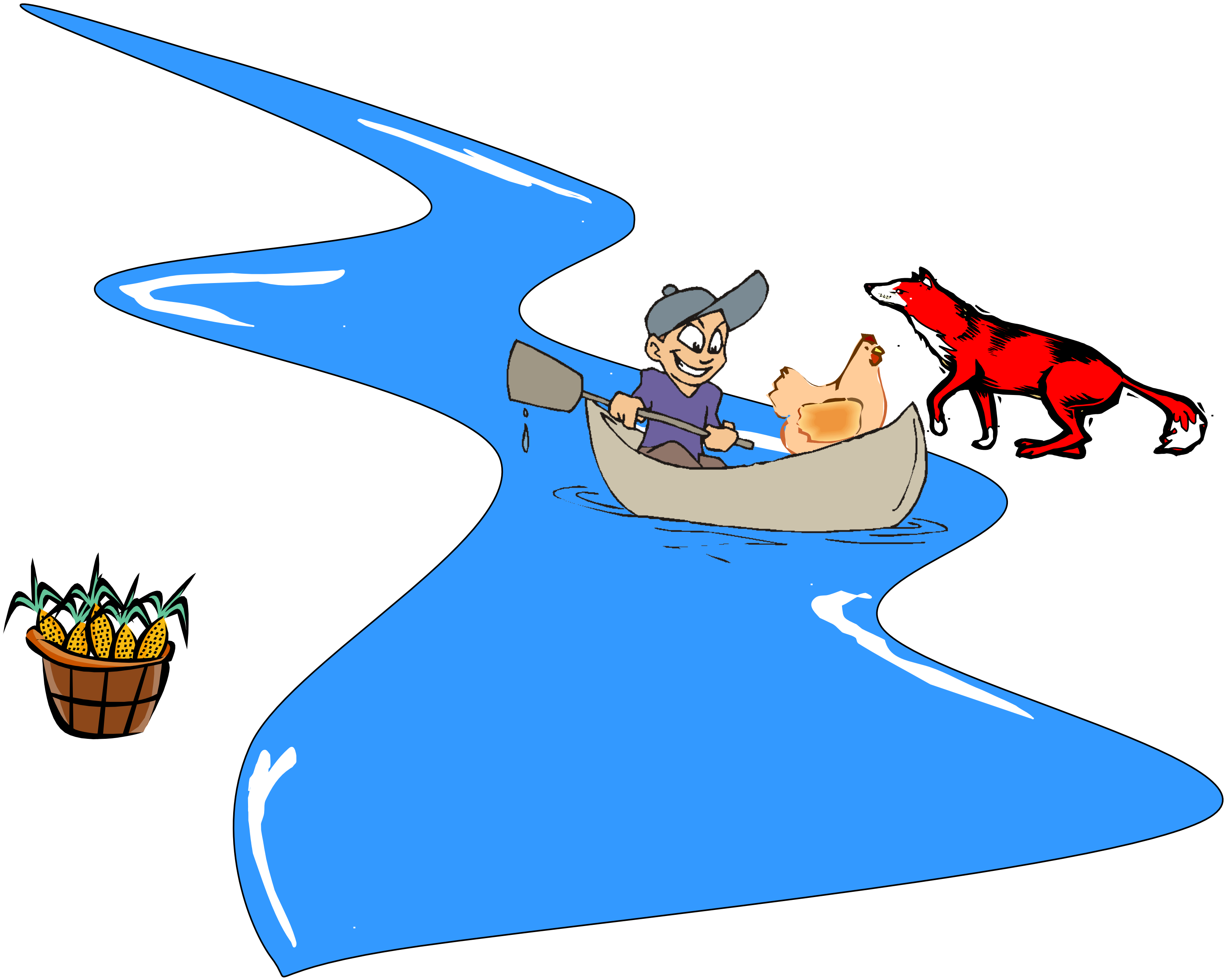
- Trust for Public Land
- Nature Conservancy
- Clear Creek Environmental Foundation
- Texas Parks & Wildlife
- Natural Resource Conservation Service
- Texas Natural Resource Conservation Commission
- US Fish & Wildlife Service
- other NGO’s with expertise and funding

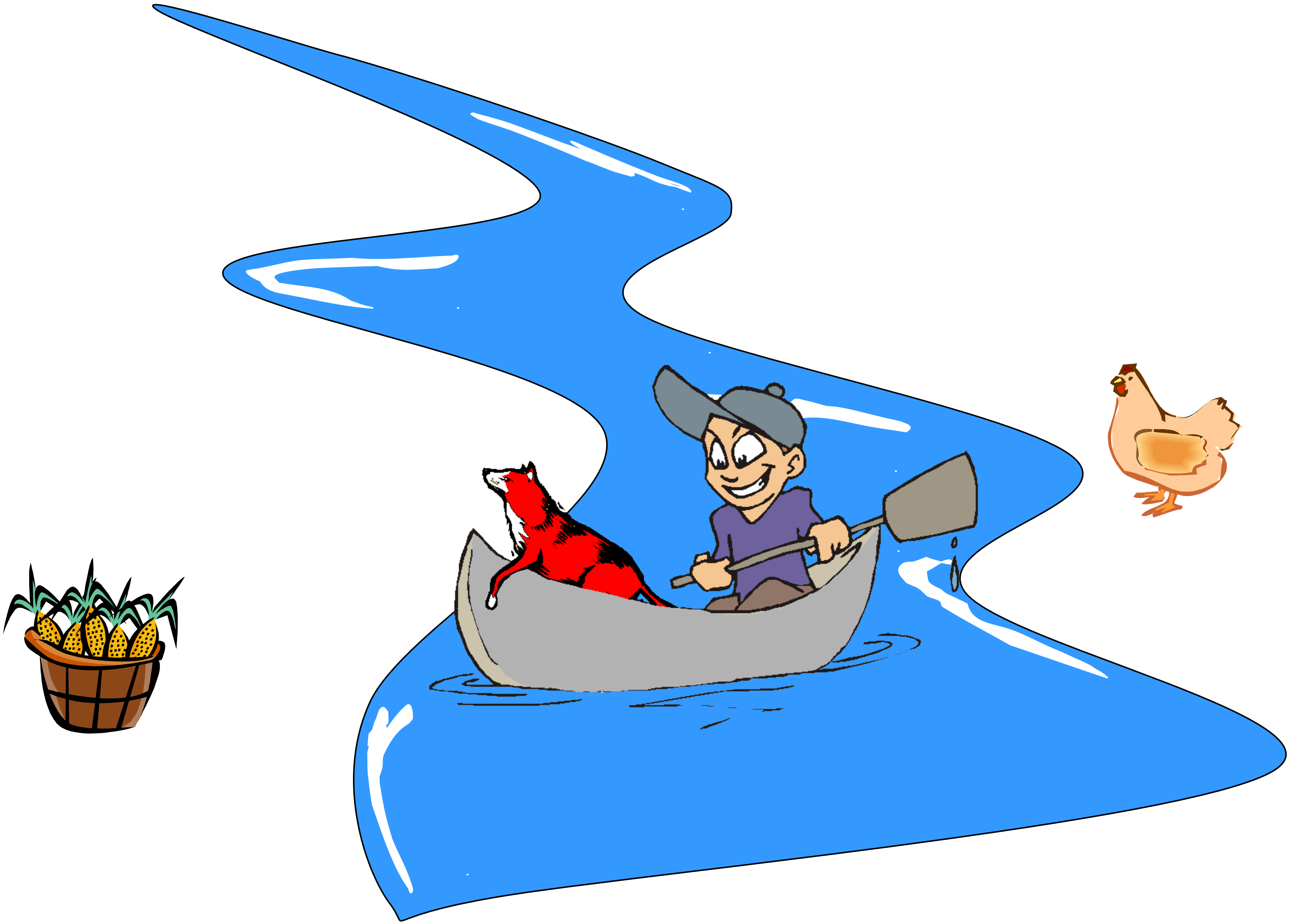


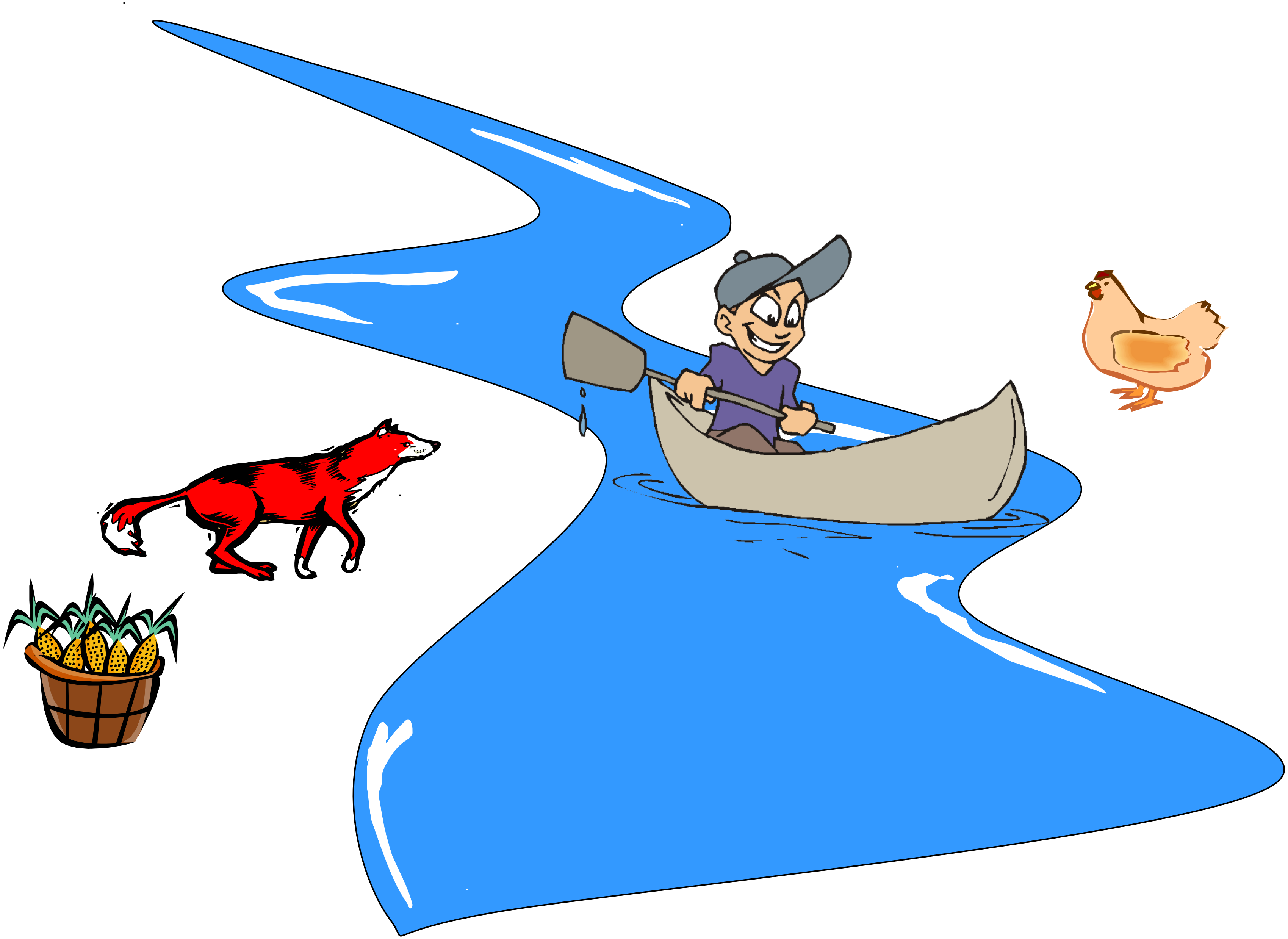


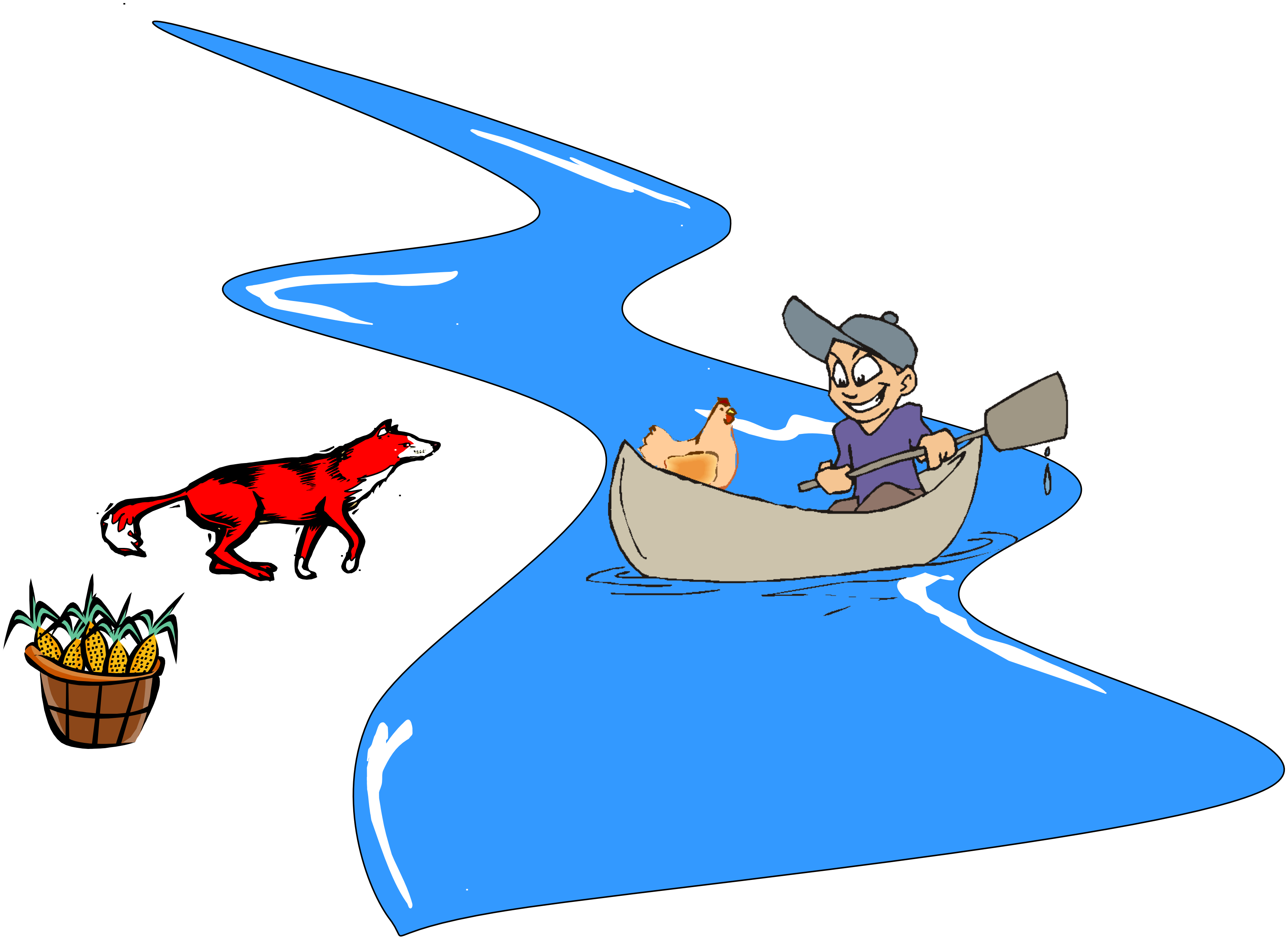


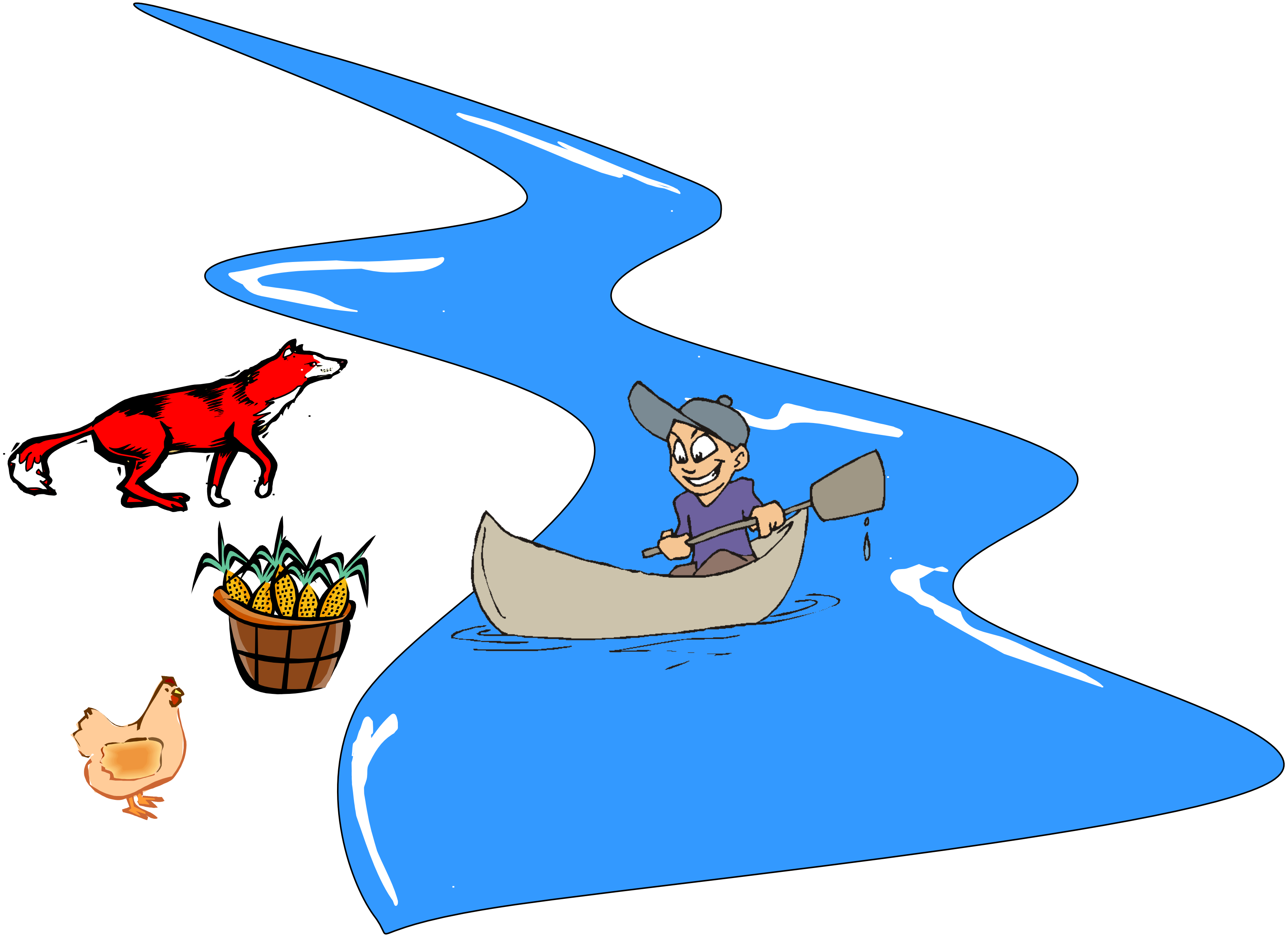


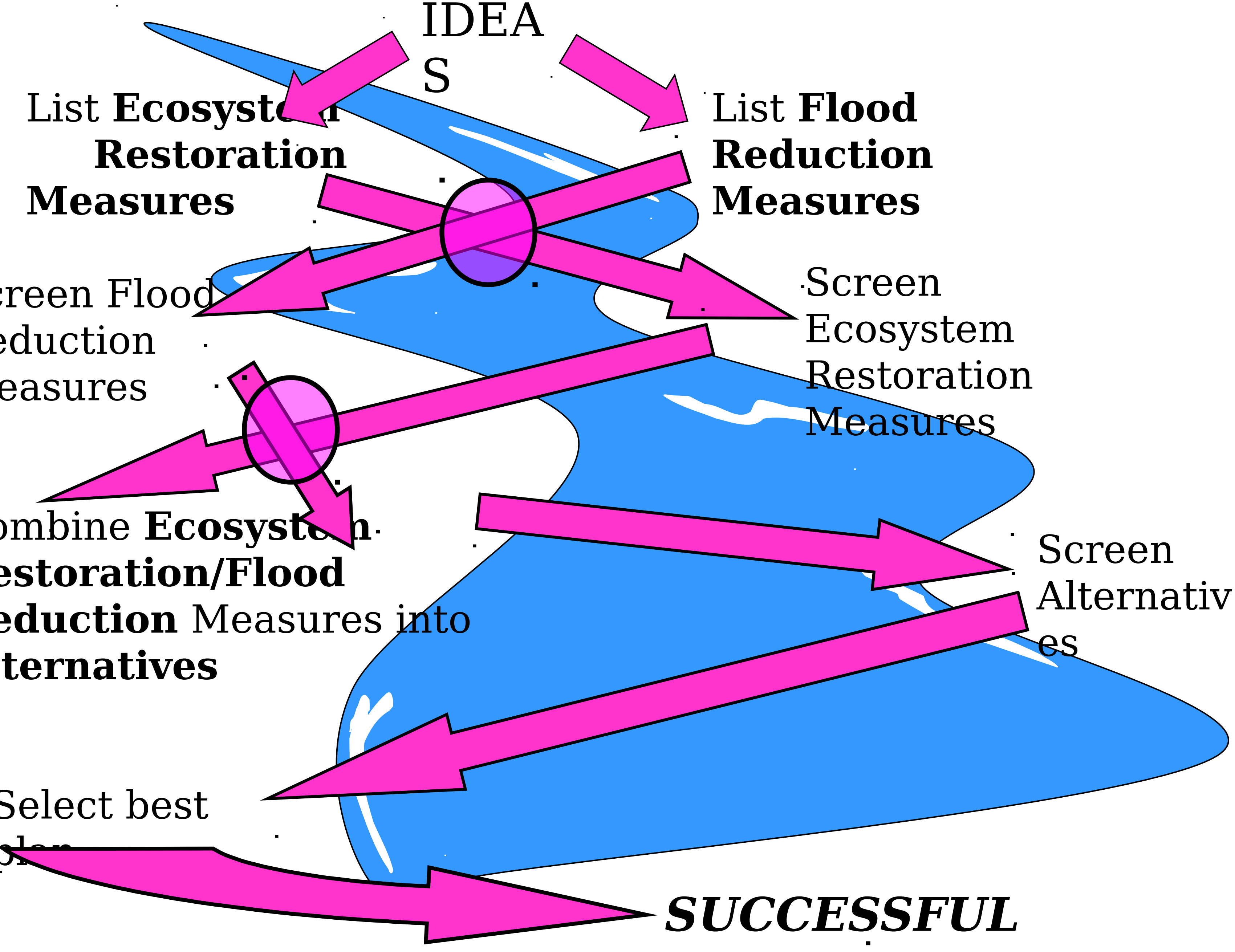












IDEAS

List **Ecosystem Restoration Measures**

List **Flood Reduction Measures**

Screen Flood Reduction Measures

Screen Ecosystem Restoration Measures

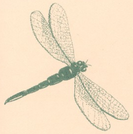
Combine **Ecosystem Restoration/Flood Reduction** Measures into **Alternatives**

Screen Alternatives

Select best plan

SUCCESSFUL PROJECT!

Public Involvement



The Clear Facts O

CLEAR CREEK

Summer 2000 Issue 1

Facts on Reducing Flood Dama

Corps to Reconsider Plan

For the past several months, the Galveston District of the U.S. Army Corps of Engineers has been engaged in a complete reevaluation of flood control solutions for the Clear Creek watershed. Three other agencies representing constituents within the watershed are co-sponsoring the new study. These sponsors include the Harris County Flood Control District, Galveston County, and Brazoria Drainage District Number Four. Brazoria Drainage District Number Four recently re-joined sponsorship of the study. Their participation expanded the area that can be studied to include reaches of Clear Creek that lie within Brazoria County.

The Corps is not committed to any pre-conceived plan, but is now considering all reasonable alternatives to the original proposal.

(continued at top of page)

The new study is expected to be completed in 2003.

The new study will completely reconsider options fo federally-funded flood control plan developed many years ago. original plan included deepening and widening Clear Creek to duce serious flooding problems that have affected some area r dents for over thirty years.

Numerous alternatives to the original proposal for Cl Creek have been raised by both project sponsors and private c zens. Alternatives under study involve a wide range of ideas. Th include channelizing portions of Clear Creek and creating byp channels and floodwater detention areas. Just as importantly, n structural options such as buying out frequently flood homeowners and raising structures are also being considered.

? What is a "GRR"...

The acronym GRR stands for General Reevaluation Report. This is the type of study that the Corps of Engineers is currently completing for the Clear Creek Flood Control Project.

A federally-proposed plan to channelize Clear Creek to help reduce flooding was approved in 1982. This original plan is now federally funded. When citizens and local sponsors asked the Corps to consider changes to the original project, the Corps was required to evaluate whether the suggested changes fit within the scope of the existing plan or if they were so significant that a reevaluation of the entire project was warranted.

The Corps reviewed the list and descriptions of suggested changes in 1998. They made the judgment that suggested changes and enhancements to the plan constituted major differences in the original proposal. That is when the decision to undertake the GRR-a complete reevaluation-was made.

Clear Lake Evaluation

The re-evaluation of flood control alternatives now being considered by the Corps and the local sponsors includes a full analysis of potential impacts on Clear Lake.

Clear Lake communities are affected by upstream activities along Clear Creek. In recognition of stakeholder concerns in the Clear Lake area, the Corps conducted a full hydraulic analysis and developed a model evaluating potential flood impacts on a project alternative proposed by the Harris County Flood Control District and Galveston County in 1997. This study, called the "Clear Lake Impact Analysis" was completed in April 1999. The Corps will use the results of this analysis to evaluate additional alternatives and assess any potential downstream impact to Clear Lake residents.

Assessment Concludes Contaminants Will Not Be Released

Residents of the Clear Creek watershed and other interes parties expressed concern about dredging and excavating activities ca ing releases of pollutants into Clear Creek. In response, the Galves District, Corps of Engineers commissioned an assessment of conta nants in Clear Creek. The assessment sampling and analysis was c ducted in cooperation with the Harris County Flood Control Distr their environmental contractor and a citizens' panel. One impor focus of the assessment was the potential for release of contamina known to exist at the Brio Superfund Site.

The 1998 study concluded that many of the contaminants of c cern were not present in samples collected from Clear Creek. Chemical c stituents that were present in the samples analyzed were measured at s insignificant levels that no adverse impacts are expected from propo activities. As various alternatives are evaluated as part of the GRR, ad tional contaminant investigations will be conducted as necessary.

What is GIS????

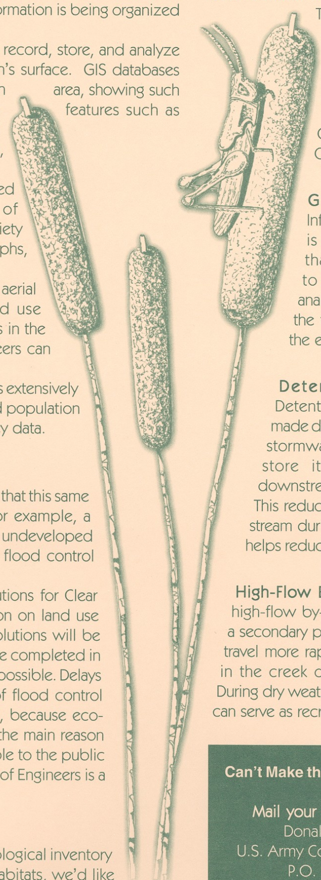
The latest information and technology is being used in the reevaluation of flood control solutions for Clear Creek. Most of the information is being organized into a "Geographic Information System" or GIS.

GIS is a computer system that can be used to record, store, and analyze information about the features that make up the earth's surface. GIS databases can generate two - or three-dimensional images of an area, showing such natural features as hills and rivers along with man-made features such as roads and power lines. Scientists use GIS databases as models, making precise measurements, gathering data, and testing ideas with the aid of a computer.

GIS databases consist of sets of information called layers. Each layer represents a particular type of geographic data. GIS layers can be created from a variety of sources, including maps, satellite and aerial photographs, and printed text and statistics.

An example of combining layers may include aerial imagery along with population statistics and land use information. Using GIS, scientists can monitor changes in the environment resulting from development, and engineers can model a variety of flood control systems.

As part of its research on Clear Creek, the Corps is extensively using GIS with newly obtained aerial imagery, updated population and land use information, and new topographic survey data.



(continued from front)

subdivisions, stores, and other commercial sites means that this same space is not available for flood control features. For example, a detention basin requires excavation of a large tract of undeveloped land. If there is no space left for the basin, another flood control solution must be found.

The current reevaluation of flood control solutions for Clear Creek, the GRR, is using the latest available information on land use and population growth. Planning for flood control solutions will be based on this information. The study is scheduled to be completed in 2003, with project implementation to follow as soon as possible. Delays in implementing the project may result in the loss of flood control options as development in the watershed continues, because eco-friendly solutions are generally land-intensive. This is the main reason why finding a viable project that is generally acceptable to the public and the local sponsors as well as the U. S. Army Corps of Engineers is a primary goal of the study.

You Can Help Us!

Consultants to the Corps are performing an ecological inventory of habitats along the creek. If you know of special habitats, we'd like to know what and where they are. Examples would be places you would go to bird-watch, look at wildflowers and other interesting plants, and generally enjoy the natural beauty of the creek.

Visit our web site at **www.clearcreekproject.com** to log your comment or submit it at the public meeting on March 15. We will have copies of maps available at the meeting so that you can mark these special locations.

Acronyms and Definitio

GRR–General Reevaluation Repo This is the type study that the Cor of Engineers ar local sponsors a currentl completing for t Clear Creek Floc Control Project.

GIS-Geographi Information System: G is a computer syste that can be use to record, store, ar analyze information abo the features that make u the earthís surface.

Detention Basi Detention basins are ma made depressions that colle stormwater and temporar store it so that it flov downstream at a slower rat This reduces the peak flow o stream during a storm event ar helps reduce flooding.

High-Flow By-Pass Channel: high-flow by-pass channel creat a secondary path for stream flow travel more rapidly between ben in the creek during storm event During dry weather, by-pass locatio can serve as recreational areas.

Can't Make the Public Meeting?

Mail your comments to:
Donald R. Allen
U.S. Army Corps of Engineers
P.O. Box 1229
Galveston, TX 77553-1229

WHO IS ON THE PROJECT TEAM?

US Army Corps
of Engineers
P.O. Box 1229
Galveston, TX 77553-1229
409-766-3051

Harris County
Flood Control Dristrict
(Lead Sponsor)
9900 Northwest Freeway
Houston, Texas 77092
713-684-4040

Galveston County
123 Rosenberg
Galveston, TX 77550

Brazoria Drainage
District Number Four
4805 W. Broadway
Pearland, TX 77581

SKEETER
TX 5187 HJ

30

11 29 '00

Harris County
Flood Control District

Permission Slip

JUST DO IT!

LTG Flowers

☑ 1. Good for customer?

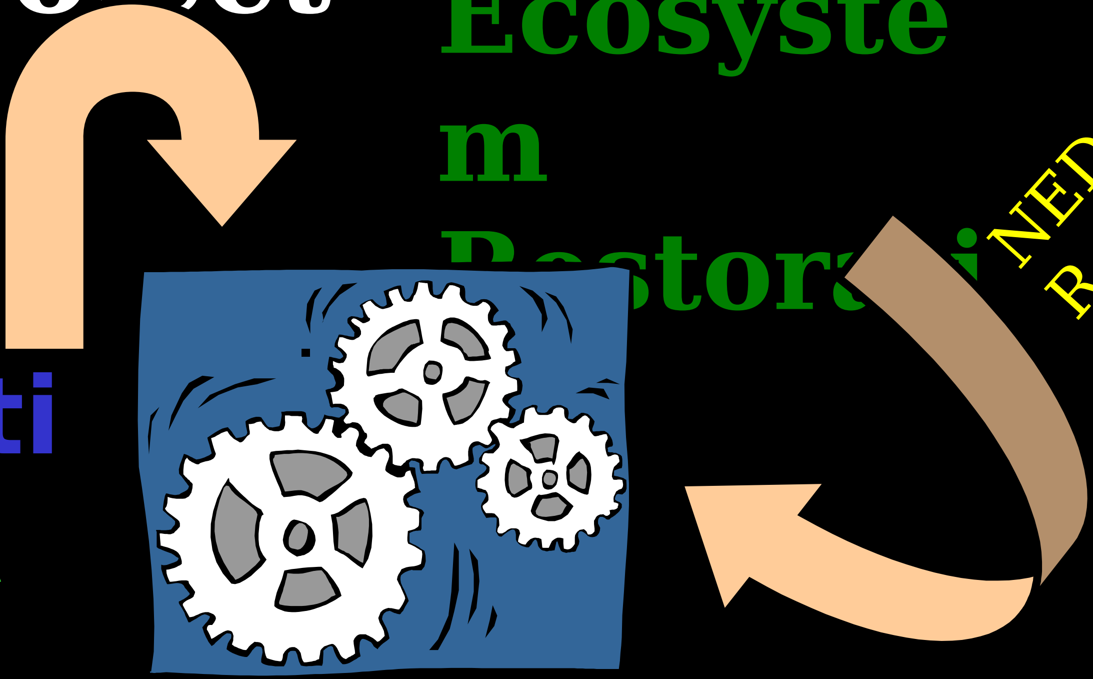
☑ 2. Legal and ethical?

☑ 3. Something I am willing to be accountable for?

Clear Creek Project

Restoration Sponsors

Ecosystem Restorati



NED/NER trade-off

Flood Reduction

Environmental Partners

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Environmentally Sustainable